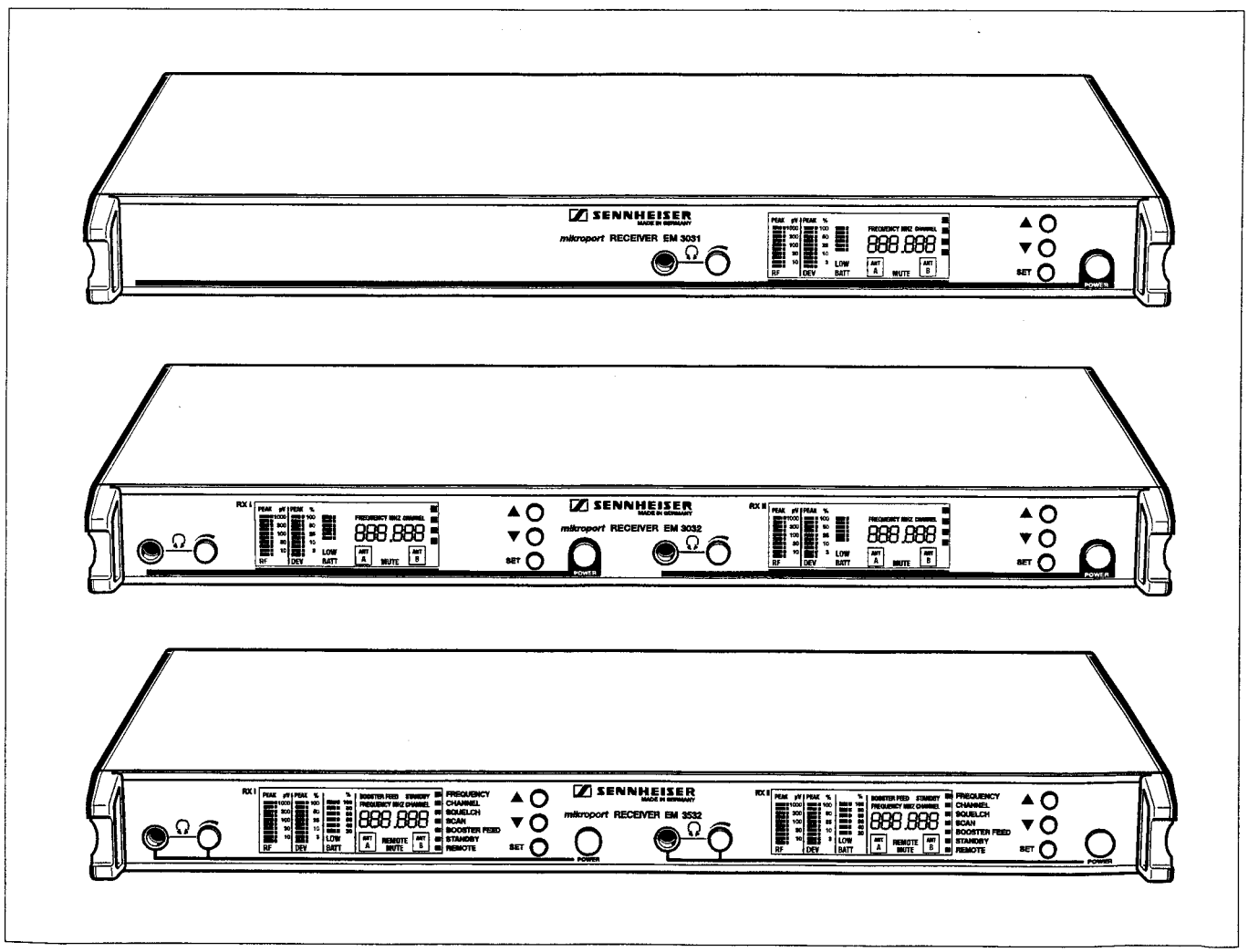
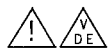
SENNHEISER
Service

EM 3031-U (Art.-Nr. / Cat no. 04555)
EM 3032-U (Art.-Nr. / Cat no. 04556)
EM 3532-U (Art.-Nr. / Cat no. 04400)
EM 3031-V (Art.-Nr. / Cat no. 04365)
EM 3032-V (Art.-Nr. / Cat no. 04201)



Sicherheitsvorschriften / Safety requirements/ Prescrizioni de sicurezza / Prescriptions de sécurité / Prescripciones de seguridad

Deutsch

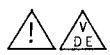


Achtung: Bei Eingriffen in das Gerät sind die Sicherheitsvorschriften nach VDE 701 (reparaturbezogen) bzw. VDE 0860 / IEC 65 (gerätebezogen) zu beachten !

Bauteile nach IEC- bzw. VDE-Richtlinien ! Im Ersatzfall nur Teile mit gleicher Spezifikation verwenden !

MOS - Vorschriften beim Umgang mit MOS - Bauteilen beachten !

English

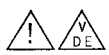


Attention: Please observe the applicable safety requirements according to VDE 701 (concerning repairs) and VDE0860 / IEC 65 (concerning type of product) !

Components to IEC or VDE guidelines ! Only use components with the same specifications for replacement !

Observe MOS components handling instructions when servicing !

Italiano

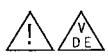


Attenzione: Osservarne le corrispondenti prescrizioni di sicurezza VDE 701 (concernente servizio) e VDE 0860 / IEC 65 (concernente il tipo di prodono) !

Componenti secondo le norme VDE risp. te IEC ! In caso di sostituzione impiegare solo componenti con le stesse caratteristiche.

Osservare le relative prescrizioni durante, lavori con componenti MOS !

Français



Attention: Prière d'observer les prescriptions de sécurité VDE701 (concernant les réparations) et VDE 0860 / IEC 65 (concernant le type de produit) !

Composants répondant aux normes VDE ou IEC. Les remplacer uniquement par des composants ayant les memes spécifications.

Lors de la manipulation des circuits MOS, respecter les prescriptions MOS !

Español

Atención: Recomendamos las normas de seguridad VDE u otras normas equivalentes, por ejemplo: VDE 701 para reparaciones, VDE 0860 / IEC 65 para aparatos !

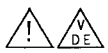
Componentes que cumplen las normas VDE / IEC. En caso de sustitución, emplear componentes con idénticas especificaciones !

Durante la reparacion observar las normas sobre componentes MOS !

USA & Canada

Attention: This set can only be operated from AC mains of 120V / 60Hz. Also observe the information given on the rear of the set !

CAUTION: For continued protection against risk of fire replace only with same type fuses!
CAUTION: To reduce the risk of electric shock, do not remove cover (or back), no user-serviceable parts inside,refer servicing to qualified service personnel.



Components to safety guidelines (IEC / U.L.) ! Only use components with the same specifications for replacement !

Observe by checking leakage-current or resistance measurement that the exposed parts are acceptably insulated from the supply circuit.

Observe MOS components handling instructions when servicing !

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1 ALLGEMEINES

1.1 INHALT DER SERVICE-ANLEITUNG

Eine Reparatur der Mikroport Empfänger EM 3031, EM 3032 und EM 3532 kann durch Baugruppentausch (bzw. Modultausch) vorgenommen werden. Diese Form der Reparatur hat sich in der Praxis bewährt und begrenzt das notwendige Funktionsverständnis auf die Baugruppen.

Auf geeigneten Meßplätzen kann die Reparatur der Module bis auf Bauteilebene erfolgen. Stromlaufpläne und gedruckte Schaltungen sind in den Schaltunterlagen enthalten.

Die Service-Anleitung vermittelt das entsprechende Wissen zur Fehlerlokalisation und Reparatur der Mikroport Empfänger EM 3031, EM 3032 und EM 3532.

1.1.1 HINWEISE ZU DEN ABSCHNITTEN

- Allgemeines

Der vorliegende Abschnitt 1.1 soll das Konzept der Service-Anleitung vermitteln und den Einstieg in die verschiedenen Abschnitte erleichtern.

- Bedienungselemente

Die Bedienung des Gerätes wird knapp und unter Voraussetzung fundierter Sachkenntnis erläutert.

- Technische Daten

Dieser Abschnitt beschreibt die technischen Daten der Mikroport Systeme EM 3031, EM 3032 und EM 3532.

- Meßgeräte und Prüfmittel

Hier sind alle für einen Abgleich, eine Reparatur oder Frequenzänderung notwendigen Service-Hilfsmittel aufgezählt.

- Systemübersicht

Die Funktion der Module innerhalb der Mikroport Empfänger EM 3031, EM 3032 und EM 3532 werden in diesem Abschnitt beschrieben.

- Service Hinweise

Das Kapitel beschreibt das allgemeine Überprüfen, das Überprüfen der Empfangseigenschaften, Abgleich und Fehlersuche, Fehlermeldungen und Tips zur Fehlersuche. Desweiteren werden Maßnahmen beschrieben, die zur Lokalisation von defekten Baugruppen führen.

- Frequenzänderungen

Hier wird detailiert auf die Programmierung über die Service-/Programmierbuchse eingegangen. Frequenzänderungen innerhalb der definierten Schaltbandbreite, außerhalb der Schaltbandbreite und der Austausch des Tuner-Moduls sind hier beschrieben.

- Prüf- und Abgleichanweisung

Der Meßaufbau, die Lokalisation der Module und die Prüf- und Abgleichanweisung (mit Oszillogrammen zur Signalverfolgung) sind hier dargestellt.

- Schaltunterlagen

Die Schaltunterlagen beinhalten sämtliche Verdrahtungspläne, Stromlaufpläne und Bestückungspläne der Module in den Mikroport Empfängern EM 3031, EM 3032 und EM 3532.

- Änderungen

Technische Änderungen, die den Inhalt dieser Service-Anleitung berühren, werden als Service-Information an den Benutzer der Service-Anleitung weitergegeben.

1 GENERAL

1.1 CONTENTS

This service manual contains instructions for troubleshooting and repairing the EM 3031, EM 3032 and EM 3532 Mikroport receivers.

A repair of the EM 3031, EM 3032 and EM 3532 Mikroport receivers can be carried out by replacing the respective subassembly or assembly. This form of repair has proved its worth in practical use, and it restricts the necessary functional knowledge to the subassemblies.

With suitable measuring and test equipment, the assembly can be repared down to the component level. Circuit diagrams, wiring diagrams and block diagrams are included in the section "SCHEMATICS".

1.1.1 INFORMATION ON THE SECTIONS

- General

Section 1.1 explains the concept of the service manual and helps the user to become acquainted with the individual sections.

- Operating elements

The operation of the receivers is briefly explained; a thorough knowledge of the subject area is assumed.

- Technical data

This section lists the technical data of the EM 3031, EM 3032 and EM 3532 Mikroport receivers.

- Measuring and test equipment

Here, all the service tools that are necessary for alignment, repair or frequency changes are listed.

- System overview

The function of the assemblies within the EM 3031, EM 3032 and EM 3532 Mikroport receivers are described in this section.

- Service instructions

This section describes general testing, testing of the reception qualities, alignment and troubleshooting, error messages, and hints for troubleshooting. In addition, measures are described to locate defective components.

- Changing the receiving frequencies

Here, detailed information is given on programming the receiving frequencies via the service/programming socket. This section also describes how to change the receiving frequencies within the defined switching bandwidth, outside the switching bandwidth and how to replace the tuner assembly.

- Test and alignment instructions

This section describes the test set-up, the localisation of assemblies and the test and adjustment instructions (with oscillograms for signal tracing).

- Schematics

This section contains all wiring diagrams, circuit diagrams and block diagrams of the assemblies of the EM 3031, EM 3032 and EM 3532 Mikroport receivers.

- Modifications

Technical modifications affecting the content of this service manual will be distributed to the users as service information.

1.2 SERVICE-KONZEPT

1.2.1 MIKROPORT MODULE

Einige der Leiterplatten sind als mehrlagige Platinen aufgebaut und können durch einen unsachgemäßen Reparaturversuch irreparabel beschädigt werden.

1.2.2 SERVICE-ANLEITUNG

Die Service-Anleitung soll dem Techniker die Möglichkeit bieten, die wichtigsten Reparatur- und Abgleicharbeiten ausführen zu können.

Die Service-Anleitung kann im Bedarfsfall auch dem Kunden ausgehändigt werden.

1.2.3 REPARATUR

a) Ist eine Reparatur durch Baugruppentausch vorgesehen, ist sie in dieser Art durchzuführen.

   - ZF-Modul, Schalt-Modul, HDP-Modul, Prozessor-Modul, Anzeige-Modul

b) Wenn keine Reparatur durch Baugruppentausch vorgesehen ist, ist das Gerät unter Zuhilfenahme der Service-Anleitung auf Bauteileebene zu reparieren.

   - Hauptplatine

c) Wenn eine Reparatur durch Baugruppentausch *oder* durch Reparatur auf Bauteilebene vorgesehen ist, liegt die Verfahrensweise im Ermessen des Service-Technikers.

   - Tuner-Modul

d) Ein schneller Service für diese Geräte bedeutet, daß alle Module der Ersatzteilliste vorrätig sind. Diese können über den Sennheiser Service bezogen werden.

1.2.4 SMD (Surface Mounted Devices)

Die Leiterplatten der Mikroport Empfänger EM 3031, EM 3032 und EM 3532 sind weitgehend mit Chip-Elementen (SMD) bestückt. Sollte beim Hantieren mit den Baugruppen ein SMD mechanisch zerstört werden, ist es erforderlich, dieses Bauelement zu ersetzen.

SMD werden direkt auf die dafür vorgesehenen Lötflächen gelötet. Hierfür besitzen sie lötfähige Stirnkontaktierungen, die weitgehend hitzeunempfindlich sind.

Zum Auswechseln ist folgendes Werkzeug erforderlich: Neben einer Pinzette und einem normalen temperaturgeregelten Lötkolben (z. B. Weller mit 0,8 mm Flachkopflötspitze PT-H 7 oder 0,8 mm Langkopflötspitze PT-K 7) sollten noch ein absolut rückschlagfreies Absauggerät und 1,2 mm Entlötlitze vorhanden sein. Sinnvoll ist eine Arbeitslupe.

Die Lötzeit ist so kurz wie möglich zu halten, damit die Leiterbahnen nicht beschädigt werden. Besonders beim Auslöten der Bauteile ist darauf zu achten, daß die Leiterbahnen nicht abgehoben werden. Danach ist die Auflagefläche der Bauteile von Lötresten zu säubern. Um mechanische Spannungen in den Bauteilen zu vermeiden, sollte man erst nach dem Erkalten der ersten Lötstelle die gegenüberliegende Seite anlöten.

Eine Wiederverwendung eines bereits ausgelöteten Chip-Bauelementes ist nicht zulässig. Dies gilt auch dann, wenn es offensichtlich fehlerfrei ist, da durch die mechanische Beanspruchung beim Ein- und Auslöten eine Beschädigung nicht ausgeschlossen werden kann.

Die SMD werden als Ersatzteile in Packeinheiten von je 50 Stück geliefert. Die Lagerbehälter müssen verwechslungssicher gekennzeichnet sein, da nur dadurch eine Unterscheidung der Bauteile möglich ist.

1.2 SERVICING

1.2.1 MIKROPORT ASSEMBLIES

Some of the printed circuit boards are multi-layer PCBs and can be irreparably damaged by improper repair or handling.

1.2.2 SERVICE MANUAL

This service manual is intended for technicians to enable them to carry out the most important repairs and alignments.

If necessary, the manual can also be given to the customer.

1.2.3 REPAIR

a) If repair is to be carried out by replacing an entire assembly, it must be carried out as follows:

   - IF assembly, Diversity assembly, HDP assembly, Processor assembly, Display assembly

b) If repair is not to be carried out by replacing an entire assembly, the device must be repaired at the component level using the service manual.

   - Main printed circuit board (PCB)

c) If repair is to carried out either by replacing an entire component *or* by a repair at the component level, this is at the discretion of the service technician.

   - Tuner assembly

d) Fast service means that all assemblies on the spare parts list have to be held in stock. They can be ordered from the Sennheiser Service Department.

1.2.4 SMDs (Surface Mounted Devices)

The PCBs of the EM 3031, EM 3032 and EM 3532 Mikroport receivers are predominantly populated with surface mounted devices (SMDs). Any SMD damaged during handling must be replaced.

SMDs are directly soldered onto the provided substrate lands. Their end caps have a solderable coating and are largely insensitive to heat.

To replace SMDs, the following tools are needed: in addition to a pair of tweezers and a normal, temperature-controlled soldering iron (e.g. Weller with a 0.8 mm flat-headed soldering bit PT-H 7 or a 0.8 mm long-headed soldering bit PT-K 7), you should have a suction device that is absolutely blow-back proof and a 1.2 mm unsoldering wire. It is also advisable to use a magnifying glass.

The soldering time should be kept as short as possible to ensure that the conductors are not damaged. Especially when unsoldering the components, care must be taken that the solder tracks are not lifted off. After soldering, the contact surface of the components must be cleaned from solder residue. To avoid mechanical stress within the components, solder one side first, then wait until this joint has cooled down before soldering the opposite side.

It is not permissible to reuse components that have previously been unsoldered, even if the component looks faultless. During soldering and unsoldering, the component is subject to thermal stress, so damage cannot be excluded.

SMDs are supplied as spares in packs of 50. Containers used to stock parts have to be unambignously labelled, as it is otherwise not possible to distinguish the components.

2 KURZBESCHREIBUNG

Die HF-Empfänger EM 3031, EM 3032 und EM 3532 bieten dem professionellen Anwender hohe Betriebssicherheit, einfache und komfortable Bedienung, die in Verbindung mit den passenden Hand- bzw. Taschensendern drahtlose Tonübertragung in Studioqualität möglich machen. Durch den Einsatz von PLL- und Mikroprozessortechnik und durch das patentierte Rauschunterdrückungsverfahren HiDyn*plus* übertreffen diese Übertragungsanlagen den Rauschabstand und die Dynamik moderner CD-Produktionen. Die True-Diversity-Technik der Empfänger EM 3031, EM 3032 und EM 3532 mit zwei getrennten Empfängerzügen sichert einen störungsfreien Betrieb und minimiert die Drop-Outs in der HF-Übertragung.

Der Einsatz mehrerer Empfänger EM 3031, EM 3032 und EM 3532 ist eine kostengünstige Alternative zu technisch aufwendigen und teueren Mehrkanalanlagen.

2.1 VARIANTEN

EM 3031, EM 3032 und EM 3532 unterscheiden sich dadurch, daß beim EM 3032 und EM 3532 in einem Gehäuse zwei getrennte True-Diversity-Empfänger untergebracht sind. Diese zwei Empfänger werden von einem gemeinsamen Netzteil und über ein gemeinsames Antennenpaar (Antennenweiche integriert) versorgt. Der EM 3532 ist mit einer DC-Speisebuchse versehen, besitzt erweiterte Bedienfunktionen und kann mit der Software SMCD über einen Personalcomputer ferngesteuert werden.

2.2 MERKMALE

- PLL-Mikroprozessorsteuerung, programmierbar
- Rauschunterdrückungssystem HiDyn*plus*
- Hohe Übertragungssicherheit (True-Diversity-Empfang)
- einfache und komfortable Bedienung
- Anzeige des Batteriestatus bei Betrieb mit entsprechenden Sendern
- Eine Höheneinheit im 19"-Gehäuse
- Speisespannung für externe Antennenverstärker

2 BRIEF DESCRIPTION

With the EM 3031, EM 3032 and EM 3532 receivers, Sennheiser offers the professional user high quality RF receivers with a high level of operational reliability and ease of use. The EM 3031, EM 3032 and EM 3532 receivers together with the suitable hand-held and pocket transmitters permit wireless sound transmission with studio quality. Due to further optimised PLL and microprocessor technology and the Sennheiser patented HiDyn*plus* noise reduction system, these transmission systems surpass the signal-to-noise ratio and dynamic range of modern CD productions. The true diversity technology of EM 3031, EM 3032 and EM 3532 receivers ensures interference-free transmission and minimises drop-outs during the RF transmission.

Especially for small television studios and theatres, the simultaneous use of several EM 3031, EM 3032 and EM 3532 receivers is an economical alternative to technically more sophisticated and therefore more expensive multi-channel systems.

2.1 VARIANTS

The EM 3031, EM 3032 and EM 3532 differ in the fact that the EM 3032 and EM 3532 contains two complete true diversity receivers in a single 1 U rack housing. These two receivers are powered by a common mains power supply unit and via a common pair of antennæ (antenna splitter integrated). The EM 3532 is equipped with a DC supply socket; its range of functions has been extended, a remote control function via PC has been implemented.

2.2 FEATURES

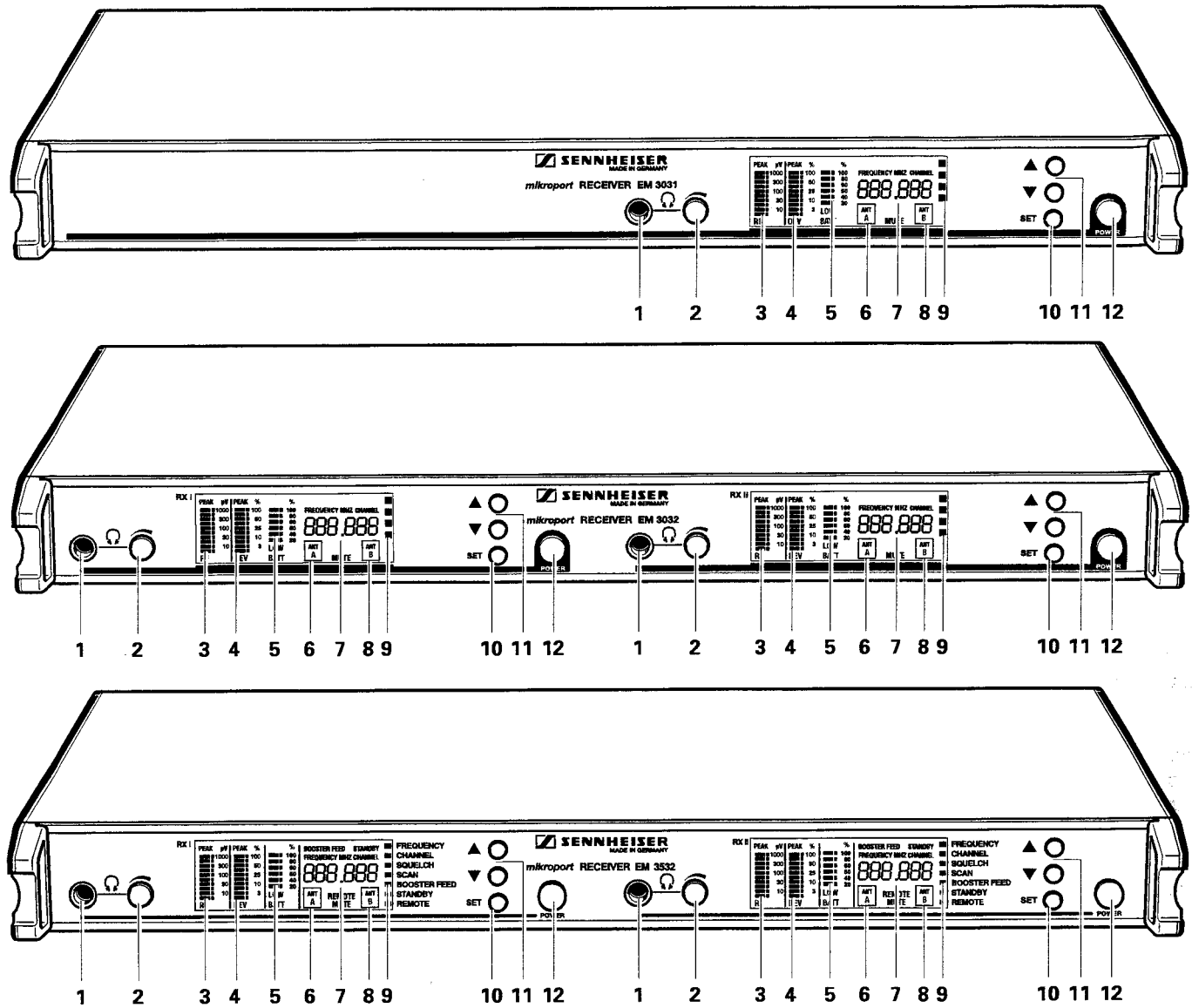
- PLL microprocessor control, programmable
- HiDyn*plus* noise reduction system
- High transmission reliability due to true diversity reception
- Ease of use
- "LOW BATT" indicator for transmitter battery status (only with certain transmitters
- 19" 1 U housing
- Supply voltage for external antenna boosters

3 BEDIENUNGSELEMENTE

3.1 FRONTSEITE

3 OPERATING CONTROLS

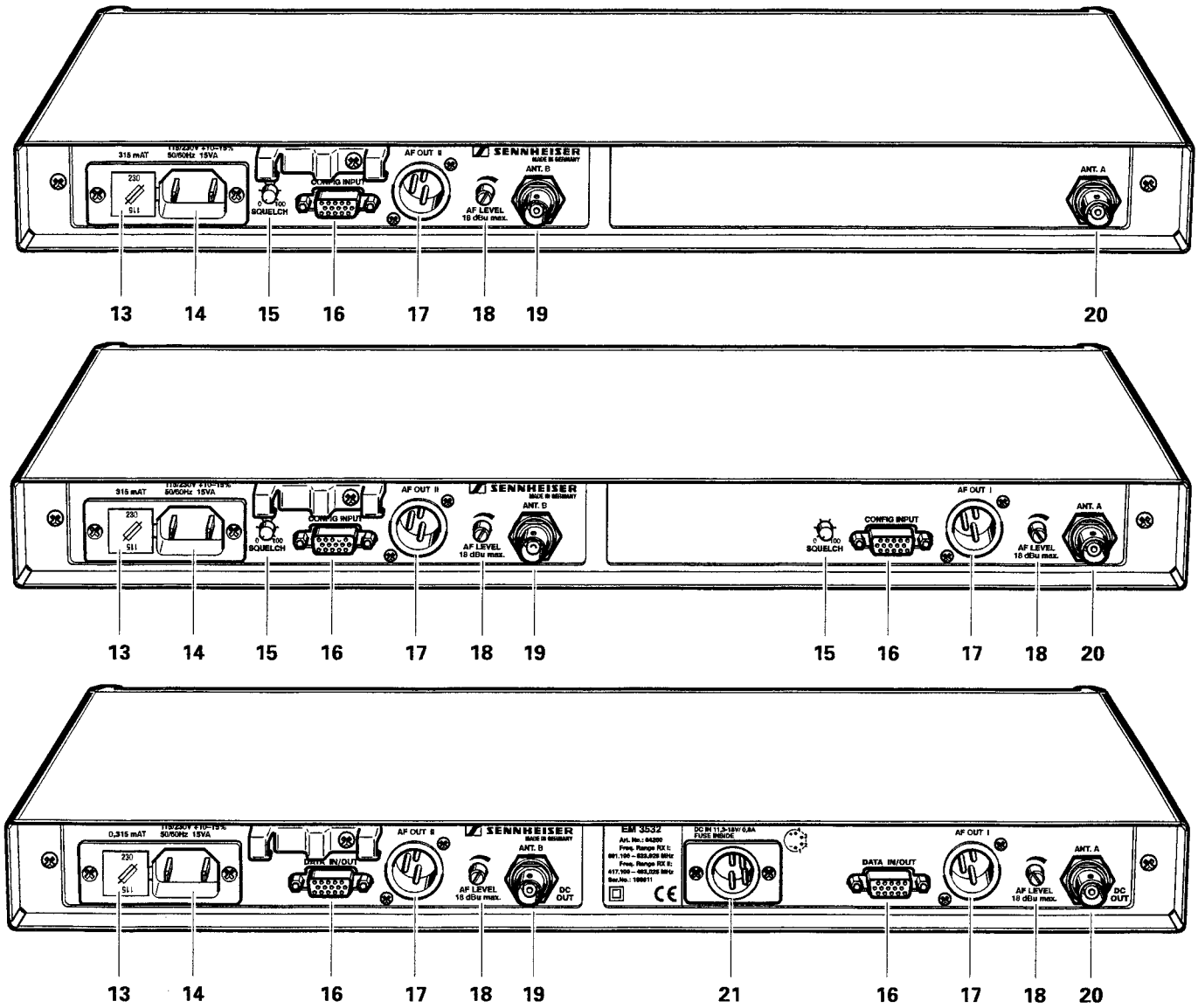
3.1 FRONT SIDE



1	Kopfhörerausgangsbuchse (6,35 mm Klinke)	**1**	Headphone socket 1/4" (6.35 mm) ø
2	Lautstärkeeinsteller für Kopfhörerausgangsbuchse	**2**	Headphone volume control
3	Feldstärkeanzeige in µV (RF)	**3**	Fieldstrength indicator in µV (RF)
4	Hubanzeige (DEV)	**4**	Deviation indicator (DEV)
5	Senderbatterie-Statusanzeige	**5**	Batterie status indicator
6	Anzeige des aktiven Diversity-Kanals (ANT A)	**6**	Indicator showing the active diversity channel (ANT A)
7	Numerische Anzeige	**7**	Numeric display
8	Anzeige des aktiven Diversity-Kanals (ANT B)	**8**	Indicator showing the active diversity channel (ANT B)
9	Anzeige der Speicherebene / Bedienauswahl	**9**	Indicator showing the storage level / user choise
10	Taste zum Speichern der Programmierung (SET)	**10**	Storage button (SET)
11	Auswahltaster (▲ ,▼)	**11**	Selector button (▲ ,▼)
12	EIN / AUS - Schalter (POWER)	**12**	ON / OFF switch (POWER)

3.2 RÜCKSEITE

3.2 REAR SIDE



13	Sicherungshalter und Umschalter der Netzspannung	**13**	Fuse holder and mains voltage selector
14	Netzanschluß (2-poliger Kaltgeräteeinbaustecker)	**14**	2-pin IEC mains connector
15	Rauschsperreneinsteller, 0 - 100 µV (SQUELCH)	**15**	Squelch control, 0 - 100 µV (SQUELCH)
16	Service-/Programmierbuchse (CONFIG INPUT)	**16**	Service interface (CONFIG INPUT)
17	NF-Ausgang, symmetrisch, XLR-3 (AF OUT)	**17**	AF output, XLR-3, balanced (AF OUT)
18	Lautstärkeeinsteller für NF-Ausgang (AF LEVEL)	**18**	Control for AF output level (AF LEVEL)
19	Antenneneingang B für Diversity-Betrieb (BNC)	**19**	Antenna input B for diversity operation (BNC)
20	Antenneneingang A für Diversity-Betrieb (BNC)	**20**	Antenna input A for diversity operation (BNC)
21	Speisebuchse 11,3 - 18 VDC / 0,8 A	**21**	DC power supply socket 11.3 - 18 VDC / 0.8 A

4 TECHNISCHE DATEN

Empfangsfrequenzbereich	*UHF:* 430 MHz - 960 MHz *VHF:* 138 MHz - 260 MHz
Schaltbandbreite	*UHF:* 24 MHz *VHF:* 7 MHz
Frequenzstabilität	*UHF:* ± 10 ppm (- 10 °C bis + 55 °C) *VHF:* ± 20 ppm (- 10 °C bis + 55 °C)
Empfangsfrequenzen	*EM 3031, EM 3032:* max. 32 kundenspezifisch programmiert *EM 3532:* max. 32, im Kanalraster frei wählbar
Kanalabstand (minimal)	300 kHz
Kanalraster (minimal)	5 kHz
1. Oszillatorfrequenz (1. LO)	*UHF:* 65,75 MHz unterhalb der Empfangsfrequenz *VHF:* 10,7 MHz unterhalb der Empfangsfrequenz
1. Zwischenfrequenz (1. ZF)	*UHF:* 65,75 MHz *VHF:* 10,7 MHz
2. Oszillatorfrequenz (2. LO)	*UHF:* 76,45 MHz (in Sonderfällen 55,05 MHz)
2. Zwischenfrequenz (2. ZF)	*UHF:* 10,7 MHz
Deemphasis	50 µs
Modulationsart	FM, Breitband
Nennhub	± 40 kHz
Spitzenhub	± 56 kHz
NF-Nennausgangspegel	+ 12 dBu
NF-Spitzenausgangspegel	+ 17,5 dBu ± 1 dBu
Monitorpegel	+ 12 dBu, max. Verstärkung = 30 dB
Klirrfaktor bei 1 kHz und Nennhub	≤ 0,5 %, typ. 0,25 %
NF-Frequenzgang (+ 1 dB / - 2 dB)	45 Hz - 20 kHz
Kompandersystem	HiDyn*plus*
Rauschsperre (Squelch)	*EM 3031, EM 3032:* 0 bis 100 µV, einstellbar auf der Rückseite *EM 3532:* 0 bis 100 µV, einstellbar über Bedienmenue
Empfindlichkeit S/N = 52 dB (Fremd mit HiDyn*plus*)	*EM 3031:* ≤ 1,0 µV *EM 3032, EM 3532:* ≤ 1,5 µV
S/N = 90 dBA (Spitzenhub mit HiDyn*plus*)	≤ 5 µV
S/N = 115 dBA (Spitzenhub mit HiDyn*plus*)	≤ 15 µV
S/N max. (1 mV, Spitzenhub mit HiDyn*plus*)	120 dBA eff 116 dB eff 106 dB CCIR peak
Begrenzungseinsatz	*EM 3031:* ≤ 1,0 µV *EM 3032, EM 3532:* ≤ 1,5 µV
Intermodulationsabstand	≥ 66 dB
Nebenempfangsdämpfung	≥ 75 dB
Spiegelfrequenzselektion	≥ 50 dB, typ. 65 dB
HF-Störspannung	≤ - 57 dBm am HF-Ausgang
Antenneneingänge	2 BNC-Buchsen
Antenneneingangsimpedanz	50 Ω
NF-Ausgänge	LINE: 3-pol XLR Einbaustecker, trafosymmetrisch MONITOR: 6,3 mm ø Klinkenbuchse, unsymmetrisch
NF-Ausgangsspannung bei Spitzenhub	LINE: 0 bis 5,6 V einstellbar, ≥ 2 kΩ MONITOR: 0 bis 2,8 V einstellbar, ≥ 600 Ω
Quellimpedanz der NF-Ausgänge	≤ 50 Ω (LINE bei max. Pegel)
Temperaturbereich	- 10 °C bis + 55 °C
Stromversorgung	115 / 230 V AC + 10 % / - 15 %
Leistungsaufnahme	*EM 3031:* 10 VA *EM 3032, EM 3532:* 15 VA
Abmessungen (ohne Montagewinkel)	436 x 228 x 43 mm (19", 1 HE)
Gewicht	*EM 3031:* ca. 3300 g *EM 3032, EM 3532:* ca. 4000 g
BTZ-Nummer	*EM 3031-U:* A 128 308H RF *EM 3032-U:* A 128 310H RF
Konformitätsnorm	*EM 3532-U:* ETS 300 445 *EM 3031-V:* ETS 300 422 *EM 3032-V:* ETS 300 445

4 TECHNICAL DATA

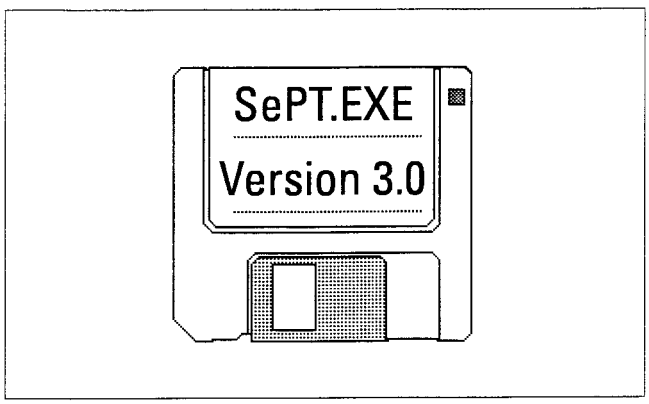
Frequency range	*UHF:* 430 MHz - 960 MHz *VHF:* 138 MHz - 260 MHz
Switching bandwidth	*UHF:* 24 MHz *VHF:* 7 MHz
Frequency stability	*UHF:* ± 10 ppm (- 10 °C to + 55 °C) *VHF:* ± 20 ppm (- 10 °C to + 55 °C)
Receiver frequencies	*EM 3031, EM 3032:* max. 32, pre-programmed *EM 3532:* max. 32 programmable in channel grid
Channel spacing (min.)	300 kHz
Channel grid (min.)	5 kHz
1st oscillator frequency (1. LO)	*UHF:* 65.75 MHz below receiver frequency *VHF:* 10.7 MHz below receiver frequency
1st intermediate frequency (1. IF)	*UHF:* 65.75 MHz *VHF:* 10.7 MHz
2nd oscillator frequency (2. LO)	*UHF:* 76.45 MHz (optional 55.05 MHz)
2nd intermediate frequency (2. IF)	*UHF:* 10.7 MHz
De-emphasis	50 µs
Modulation	wideband FM
Nominal deviation	± 40 kHz
Peak deviation	± 56 kHz
Nominal AF output level	+ 12 dBu
Peak AF output level	+ 17.5 dBu ± 1 dBu
Monitor level	+ 12 dBu, max. amplification = 30 dB
THD at 1 kHz and nominal deviation	≤ 0.5 %, typ. 0.25 %
AF frequency response (+ 1 dB/- 2 dB)	45 Hz - 20 kHz
Compander system	HiDyn*plus*
Squelch	*EM 3031, EM 3032:* 0 - 100 µV, adjustable (rear side) *EM 3532:* 0 - 100 µV, programmable (menue)
Sensitivity S/N = 52 dB (unweighted with HiDyn*plus*)	*EM 3031:* ≤ 1.0 µV *EM 3032, EM 3532:* ≤ 1.5 µV
S/N = 90 dBA (peak deviation with HiDyn*plus*)	≤ 5 µV
S/N = 115 dBA (peak deviation with HiDyn*plus*)	≤ 15 µV
S/N max. (1 mV, peak deviation with HiDyn*plus*)	120 dBA eff 116 dB eff 106 dB CCIR peak
Limiter threshold	*EM 3031:* ≤ 1.0 µV *EM 3032, EM 3532:* ≤ 1.5 µV
Intermodulation attenuation	≥ 66 dB
Adjacent channel rejection	≥ 75 dB
Image rejection	≥ 50 dB, typ. 65 dB
Free field interference radiation	≤ - 57 dBm at the AF output
Antenna inputs	2 BNC sockets
Antenna input impedance	50 Ω
AF outputs	LINE: 3-pin XLR, transformer-balanced MONITOR: 1/4" (6.3 mm) ø jack plug, unbalanced
AF output voltage at peak deviation	LINE: 0 - 5.6 V, adjustable, ≥ 2 kΩ MONITOR: 0 - 2.8 V, adjustable, ≥ 600 Ω
Source impedance of AF output	≤ 50 Ω (LINE at max. level)
Temperature range	- 10 °C to + 55 °C
Power supply	115 / 230 V AC + 10 % / - 15 %
Power consumption	*EM 3031:* 10 VA *EM 3032, EM 3532:* 15 VA
Dimensions (without rack mount ears)	436 x 228 x 43 mm (19", 1 U)
Weight	*EM 3031:* approx. 3300 g *EM 3032, EM 3532:* approx. 4000 g

5 MESSGERÄTE UND PRÜFMITTEL

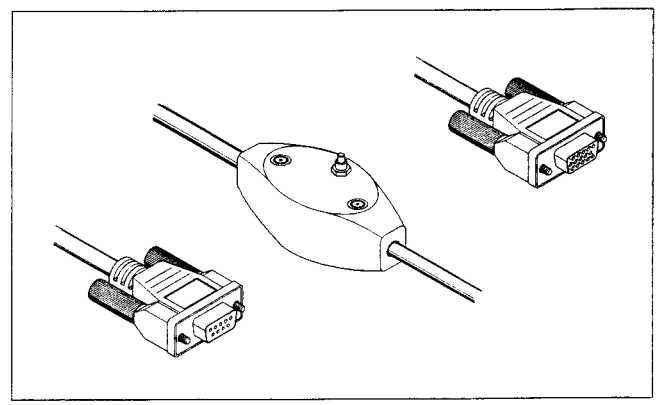
1 Spektrum-Analysator (z.B. Advantest R 4131 A)
1 Tracking-Generator (z.B. Advantest TR 4131 A)
1 HF-Signalgenerator (z.B. Rohde & Schwarz SMS 2)
1 Frequenzmeßgerät (z.B. HEB Digicount)
1 NF-Multimeter (z.B. Sennheiser UPM 550-1)
1 Oszilloskop (z.B. Hameg 605)
1 Voltmeter Ri ≥ 1 MΩ / V (z.B. Thandar TM 351)
1 Amperemeter (z.B. Thandar TM 351)
1 IBM-kompatibler PC (mit Windows ab V3.1)

5.1 SPEZIELLE SERVICE-HILFSMITTEL

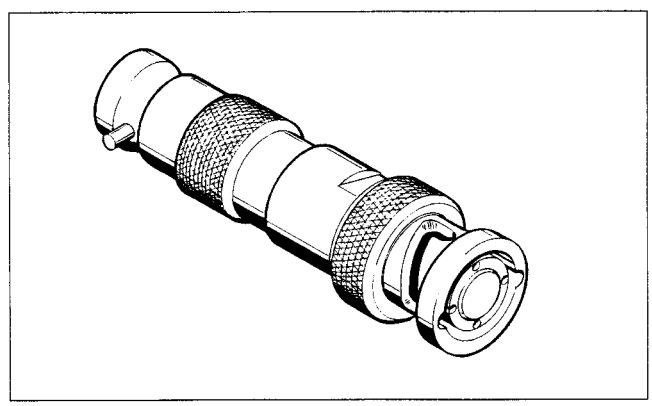
- Service-Adapter M-SePT2 PH (Bestell-Nr. 70507)
- Programmier-Software SePT.EXE V3.0 (Bestell-Nr. 70502)
- DC-Trennadapter M10 (Bestell-Nr. 40838)



Programmier-Software SePT.EXE V3.0 (Bestell-Nr. 70502)
SePT.EXE V3.0 programming tool (spare part no. 70502)



Service-Adapter M-SePT2 PH (Bestell-Nr. 70507)
M-SePT2 PH service adaptor (spare part no. 70507)



DC-Trennadapter M10 (Bestell-Nr. 40838)
M10 DC voltage isolating adaptor (spare part no. 40838)

5.2 SERVICE-SET SePT2

Die neuen Service-Hilfsmittel sind auch komplett als Service-Set SePT2 (Bestell-Nr. 70532) erhältlich. Das Set besteht aus:

- 1 x Service-Adapter M-SePT2 PH
- 1 x Programmier-Software SePT.EXE V3.0
- 1 x Software-Registrationskarte
- 1 x Installationshinweise

5 MEASURING AND TEST EQUIPMENT

1 Spectrum analyser (e.g. Advantest R 4131 A)
1 Tracking generator (e.g. Advantest TR 4131 A)
1 RF signal generator (e.g. Rohde & Schwarz SMS 2)
1 Frequency meter (e.g. HEB Digicount)
1 AF multimeter (e.g. Sennheiser UPM 550-1)
1 Oscilloscope (e.g. Hameg 605)
1 Voltmeter Ri ≥ 1 MΩ / V (e.g. Thandar TM 351)
1 Ammeter (e.g. Thandar TM 351)
1 IBM compatible PC (with Windows, version 3.1 or later)

5.1 SPECIAL SERVICE TOOLS

- M-SePT2 PH service adaptor (spare part no. 70507)
- SePT.EXE V3.0 programming tool (spare part no. 70502)
- M10 DC voltage isolating adaptor (spare part no. 40838)

5.2 SePT2 SERVICE SET

All new service tools are available as a complete set (spare part no. 70532). This set contains:

- 1 x M-SePT2 PH service adaptor
- 1 x SePT.EXE V3.0 programming tool
- 1 x software registration card
- 1 x installation instructions

6 SYSTEMÜBERSICHT

6.1 ÜBERSICHT DER MODIFIKATIONEN

Die folgende Tabelle zeigt eine Übersicht der Empfänger der 3000er Serie sowie die Möglichkeiten der Nachrüstung. Detailierte Anweisungen zu den Modifikationen sind dem Kapitel "Modifikationen" zu entnehmen.

6 SYSTEM OVERVIEW

6.1 MODIFICATION OVERVIEW

The following table shows an overview of the 3000 receiver series and possible modifications. Detailed instructions to this modifications you will find in the chapter "modifications".

Gerätebezeichnung Product name	Artikelnummer Catalog no.	Frequenzbereich Frequency range	Schaltbandbreite Switching bandwidth	Empfänger1 Receiver1	Empfänger2 Receiver2	DC-Speisung DC powering	S-MCD S-MCD
EM 3031-U	04555	434 - 960 MHz	24 MHz	X	–	O	–
EM 3032-U	04556	434 - 960 MHz	24 MHz	X	X	O	O
EM 3532-U	04400	434 - 960 MHz	24 MHz	X	X	X	X
EM 3031-V	04365	138 - 260 MHz	7 MHz	X	–	O	–
EM 3032-V	04201	138 - 260 MHz	7 MHz	X	X	O	–

X *bestückt* – *nicht bestückt* O *nachrüstbar*

X *equipped* – *not equipped* O *optionally*

6.2 ÜBERSICHT DER MODULVERWENDUNG

Die folgende Tabelle zeigt eine Übersicht der Module in den Empfängern der 3000er Serie. Detailierte Informationen zu den Modulen sind den entsprechenden Kapiteln der Service-Anleitung zu entnehmen.

6.2 ASSEMBLY OVERVIEW

The following table shows an overview of the 3000 receiver series and the used assemblies. Detailed informations to the modifications you will find in the chapter "modifications".

Gerätebezeichnung Product name	Tuner-Modul Tuner Assembly *ASSY2*	ZF-Modul IF Assembly *ASSY1, ASSY2*	Schalt-Modul Diversity Assembly *ASSY3*	HDP-Modul HDP Assembly *ASSY4*	Prozessor-Modul Processor Assembly *ASSY5*	Anzeige-Modul Display Assembly *ASSY6*	DC/DC-Modul DC/DC Assembly *ASSY1*
EM 3031-U	1 x A001	2 x A002	1 x A003	1 x A004	1 x A015	1 x A006	1 x A007
EM 3032-U	2 x A001	4 x A002	2 x A003	2 x A004	2 x A015	2 x A006	2 x A007
EM 3532-U	2 x A001*	4 x A002	2 x A003	2 x A004	2 x A014	2 x A006	2 x A007
EM 3031-V	1 x A012	2 x A002	1 x A003	1 x A004	1 x A015	1 x A006	1 x A007
EM 3032-V	2 x A012	4 x A002	2 x A003	2 x A004	2 x A015	2 x A006	2 x A007

*) Die Tuner A001 im Empfänger EM 3532-U unterscheiden sich durch die Programmierung von den in den Empfängern EM 3031/32-U verwendeten. Näheres dazu beschreibt das Kapitel 8.4 auf Seite 20.

*) The A001 tuner assemblies used in the EM 3532-U receivers are different to the A001 tuner assemblies in the EM 3031/32. More detailes are given in chapter 8.4 on page 20.

NOTIZEN:

NOTES:

7 SERVICE HINWEISE

7.1 ALLGEMEINES ÜBERPRÜFEN

Zur Eingrenzung von Fehlern empfiehlt es sich den Empfänger mit einem funktionsfähigen Sender (z.B. SKM 3072/SKM 5000) zu überprüfen. Hierzu wird der Handsender wie in der Praxis betrieben. Der Empfänger wird betriebsbereit gemacht (Netzstecker einstecken, Empfänger einschalten, Kanalwahlschalter auf Sendefrequenz einstellen, Antennen anschließen, Verstärker am Ausgang anschließen (oder Kopfhörer in Kopfhörerausgang kontaktieren) und Signal abhören). Im Praxistest wird der Empfänger nun auf folgende Merkmale überprüft:

1. Klang (Modulation, Verzerrungen)
2. Rauschen (Empfindlichkeit, Reichweite min. 50 m)
3. Diversityverhalten (Sender im Abstand von ca. 1 Meter zwischen den Antenneneingängen, evtl. Betrieb des Empfängers ohne Antennen, hin und her bewegen)
4. Funktion der Bedienelemente (Volume, Squelch, Channel)
5. Wackelkontakte (Abklopfen)

7.2 EMPFANGSEIGENSCHAFTEN ÜBERPRÜFEN

Bei Empfängern die vermutlich eine unzureichende Empfindlichkeit haben (mangelnde Reichweite) ist dieses mit Hilfe eines HF-Signalgenerators zu überprüfen. Hierzu ist der HF-Signalgenerator (HF-Trägerfrequenz auf mittleren Kanal innerhalb der Schaltbandbreite, HF-Ausgangsspannung 100 µV, Frequenzhub 40 kHz, Modulation 1 kHz) über DC-Trennadapter an den Antenneneingang ANT. A anzuschließen. Der Empfänger wird nun betriebsbereit gemacht (Netzstecker einstecken, Empfänger einschalten, Kanalwahlschalter einstellen, NF-Multimeter und Oszilloskop an Ausgang J3 anschließen und Signal am NF-Multimeter abhören). Nun die Messungen Nr. 9 bis 10 der Prüf- und Abgleichanweisung durchführen. Anschließend die Funktion der Rauschsperre und der Anzeigen überprüfen.

7 SERVICE INSTRUCTIONS

7.1 GENERAL TEST

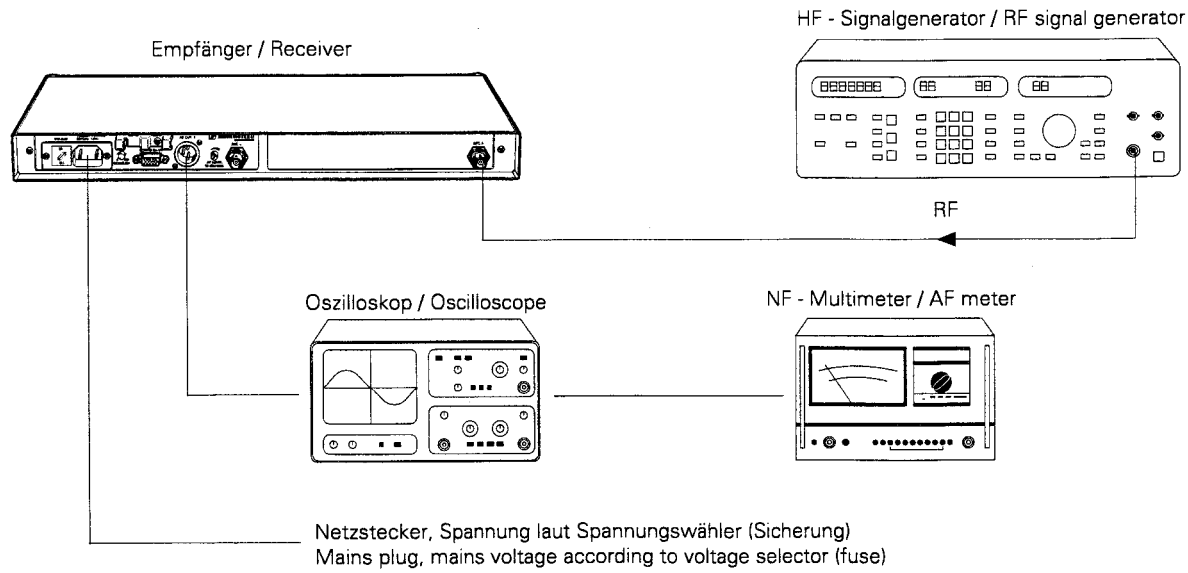
To narrow down the possible causes of faults, it is advisable to test the receiver with an operational transmitter (e.g. SKM 3072/SKM 5000). Put the receiver into operation (connect the plug-in mains unit, switch the receiver on, set the channel selector switch to the transmitter frequency, connect antennas connect a monitoring amplifier to the receiver output - or connect a headphone to the headphone output - and listen to the signal). In a practical test, the receiver is now checked for the following:

1. Sound quality (modulation, distortion)
2. Noise (sensitivity, range min. 50 m)
3. Diversity operation (transmitter at a distance of approx. 1 m between the antenna inputs; perhaps operate the receiver without antennæ and move it back and forth)
4. Functioning of operating elements (volume control, squelch, channel selector switch)
5. Loose contacts (by knocking at the housing)

7.2 RECEPTION TEST

If the sensitivity of the receiver is probably too low (range is reduced), test the sensitivity with an RF signal generator. Connect the RF signal generator (set the RF carrier frequency to a channel in the center of the switching bandwidth, RF output voltage 100 µV, deviation 40 kHz, modulation 1 kHz) via a DC voltage isolating adaptor to antenna input ANT.A. Put the receiver into operation (connect the plug-in mains unit, switch the receiver on, set the channel selector switch, connect the AF multimeter and the oscilloscope to the J3 output and listen to the signal at the AF multimeter). Now carry out measurements 9 and 10 of the test and alignment instructions. Then check the functioning of the squelch and the displays.

MESSAUFBAU / **TEST SET-UP**


Empfänger / Receiver
HF - Signalgenerator / RF signal generator
RF
Oszilloskop / Oscilloscope
NF - Multimeter / AF meter
Netzstecker, Spannung laut Spannungswähler (Sicherung)
Mains plug, mains voltage according to voltage selector (fuse)

HF-Signalgenerator auf Empfangsfrequenz,
HF-Ausgangsspannung 100 µV,
Frequenzhub 40 kHz,
Modulation 1kHz

RF signal generator to receiver frequency,
RF output voltage 100 µV,
Deviation 40 kHz,
Modulation 1kHz

7.3 ABGLEICH UND FEHLERSUCHE

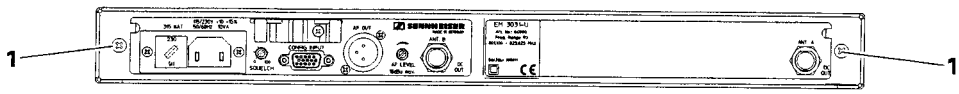
Zum Abgleich und zur Reparatur ist das Gehäuse der Empfänger zu demontieren.

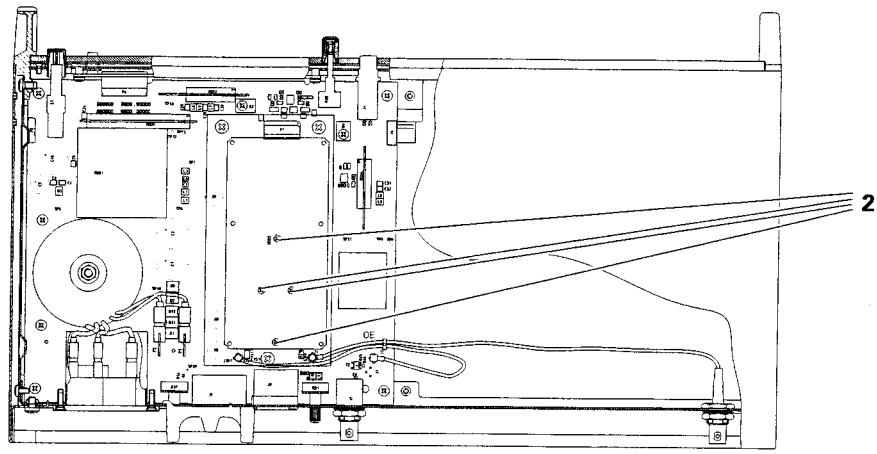
1. Gehäuse öffnen; dazu mit Schraubendreher zwei Schrauben (**1**) auf der Rückseite des Chassis lösen und entfernen. Chassis nach vorne aus dem Gehäuse ziehen.
2. Schrauben (**2**) des Abschirmdeckels lösen und entfernen.

7.3 ALIGNMENT AND TROUBLESHOOTING

For alignment or repairs the receivers have to be disassembled.

1. For opening the housing, unlock two screws (**1**) on the rear of the chassis with a screwdriver. Pull the chassis forwards out of the housing.
2. Remove the screws (**2**) from the lid of the RF screen.





3. Abschirmdeckel von Abschirmprofil entnehmen.
4. Beim Abgleich ist auf die Position der Widerstandstrimmer zu achten.

Max. Links | Mittelstellung | Max. Rechts | toter Bereich

Achtung! Die Widerstandstrimmer haben keinen Anschlag. Beim Abgleich ist darauf zu achten, daß Einstellungen nicht am Rande oder im "toten Bereich" vorgenommen werden.

5. Empfänger betriebsbereit machen; dazu Netzstecker an Stromversorgungsbuchse anschließen. Empfänger über Trenntransformator versorgen.
6. Empfänger mit Betriebsschalter S1 einschalten.
7. Mit Schalter "SET" und "UP", bzw. "DOWN" auf Kanal in der Mitte der Schaltbandbreite schalten.
8. HF-Signalgenerator wie in der Prüf- und Abgleichanweisung beschrieben an Antenneneingang ANT. A anschließen. Dazu DC-Trennadapter M10 (Bestell.-Nr. 40838) verwenden, da am Antenneneingang die Boosterspeisung liegt.

   Grundeinstellungen des HF-Signalgenerators:
   HF-Trägerfrequenz: wie 7.,
   HF-Ausgangsspannung: 100 µV,
   Frequenzhub: 40 kHz,
   Modulation: 1 kHz
9. NF-Ausgang J3 mit NF-Multimeter und Oszilloskop verbinden (XLR-Buchse J3, Pin2 nach Pin3, Pin1 - Masse).
10. Prüf- und Abgleichanweisung durchführen. Bei stark abweichenden Meßwerten können die Leiterplatten unter Zuhilfenahme des Stromlaufplans repariert werden oder komplette Module getauscht werden.

3. Remove the lid.
4. During alignment, pay attention to the position of the trimming resistors:

left max. | centre position | right max. | dead band

Attention! The trimming resistors do not have an end stop. When aligning, make sure that they are not set near or in the dead band.

5. To put the receiver into operation, connect the plug-in mains to the mains. Power the receiver via an isolating transformer.
6. Switch the receiver on with operating switch S1.
7. With the buttons "SET" and "UP" or "DOWN", select the channel at the middle of the receiver's switching bandwidth.
8. Connect the RF signal generator to the antenna input ANT.A as described in the test and alignment instructions. Use the M10 DC voltage isolating adaptor (spare part no. 40838), as the booster supply is applied to the antenna input.

   Basic settings of the RF signal generator:
   RF carrier frequency: as in 7,
   RF output voltage: 100 µV,
   Deviation: 40 kHz,
   Modulation: 1 kHz
9. Connect the AF output J3 to the AF multimeter and the oscilloscope (XLR socket J3, pin2 to pin3, pin1 - GND).
10. Carry out test and alignment instructions. If the measured values deviate strongly from the required values, the PCBs can be repaired using the circuit diagram or complete assemblies can be replaced.

7.4 FEHLERMELDUNGEN EM 3031 UND EM 3032

Bei Störungen und internen Fehlfunktionen detektiert der Mikroprozessor der Empfänger EM 3031 und EM 3032 dieses und zeigt eine Fehlermeldung auf dem Anzeige-Modul an.

ERR 1: Der Prozessor (Prozessor-Modul / U3) hat keinen Kontakt zum EEPROM (Tuner-Modul / U203).

Mögliche Ursachen:

- Leitungen zwischen Prozessor-Modul und Tuner-Modul unterbrochen oder kurzgeschlossen.
- Spannungsversorgung des Tuner-Moduls ausgefallen.
- EEPROM U203 auf dem Tuner-Modul defekt.
- PLL-Kreis defekt.

ERR 2: EEPROM U203 im Tuner-Modul leer.

Mögliche Ursachen:

- EEPROM falsch programmiert (z.B. Abbruch während des Programmiervorgangs).

ERR 3: Falsches Tuner-Modul im Empfänger. Geräte arbeiten nur mit EM 3031-U, 3032-U, EM 3031-V, 3032-V oder SPARE30-U, SPARE30-V konfigurierten Tuner-Modulen.

Mögliche Ursachen:

- Das falsche Tuner-Modul ist bestückt worden.

ERR 4: PLL hat nicht gerastet.

Mögliche Ursachen:

- + 8 VDC Betriebsspannung am Tuner-Modul fehlt.
- + 5 VDC an der PLL fehlen.
- PLL defekt.
- Oszillatorspannung (VCO) nicht im Regelbereich.
- Nach Programmierung der Schaltbandbreite mit der Software SePT.EXE erfolgte kein Abgleich des Tuner-Moduls.
- Nach Programmierung der Kanalfrequenzen mit der Software SePT.EXE sind Kanalfrequenzen außerhalb der Schaltbandbreite des Tuner-Moduls programmiert worden.

7.5 FEHLERMELDUNGEN EM 3532-U

Ein Ausrasten der PLL detektiert der Mikroprozessor des Empfängers EM 3532-U und zeigt dieses durch Blinken der Frequenz-/Kanalanzeige auf dem Anzeige-Modul an.

7.6 TIPS ZUR FEHLERSUCHE

Mit der Prüf- und Abgleichanweisung läßt sich eine Überprüfung und eine Signalververfolgung des Empfängers durchführen. Anhand der ermittelten Werte lassen sich Aussagen über defekte Schaltungsteile und defekte Module treffen.

Die defekten Bauteile, bzw. Module können im Servicefall durch entsprechende Ersatzteile ersetzt werden.

Bei vermuteten Fehlern im Bereich des Prozessor-Moduls und des Anzeige-Moduls ist ebenfalls nach der Prüf- und Abgleichanweisung (Nr. 6 - 6.4 und Nr. 8 - 8.2) zu verfahren. Läßt sich danach keine eindeutige Fehlerdiagnose stellen, ist bei ausgeschaltetem Empfänger der Flexverbinder des Anzeige-Moduls von der Hauptplatine (P6) zu lösen. Anschließend ist das Anzeige-Modul durch ein funktionsfähiges Ersatz-Anzeige-Modul auszutauschen (lediglich Flexverbinder in P6 stecken). Ist der Fehler des Empfängers nun beseitigt, ist das Ersatz-Anzeige-Modul ordnungsgemäß zu montieren. Tritt der gleiche Fehler erneut auf, ist das Prozessor-Modul auszutauschen und der Empfänger erneut auf den Fehler zu überprüfen.

7.4 EM 3031 AND EM 3032 ERROR MESSAGES

Errors or internal malfunctions are detected by the receiver's microprocessor and an error message is displayed on the display assembly.

ERR 1: The processor (processor assembly / U3) has no contact to the EEPROM (tuner assembly / U203).

Possible causes:

- Connections between the processor assembly and the tuner assembly are interrupted or short circuited.
- Voltage supply to the tuner assembly has failed.
- EEPROM U203 on the tuner assembly is defective.
- PLL is defective.

ERR 2: EEPROM U203 in the tuner assembly is empty.

Possible causes:

- EEPROM has been wrongly programmed (e.g. cancellation during the programming process).

ERR 3: Wrong tuner assembly in the receiver. Receivers only work with tuner assemblies configured for EM 3031-U, 3032-U, EM 3031-V, 3032-V or SPARE30-U, SPARE30-V.

Possible causes:

- Replacement tuner assembly has been confused.

ERR 4: PLL has not locked.

Possible causes:

- + 8 VDC operating voltage at tuner assembly is not present.
- + 5 VDC at PLL is not present.
- PLL is defective.
- Oscillator voltage (VCO) is outside the tuning voltage.
- After programming the switching bandwidth with the SePT.EXE software, the tuner assembly has not been aligned.
- After programming the channel frequencies with the SePT.EXE software, channel frequencies have been programmed outside the switching bandwidth of the tuner assembly.

7.5 EM 3532-U ERROR MESSAGES

When the PLL unlock error is detected by the microprocessor of the EM 3532 receiver, the display indicates this by blinking.

7.6 HINTS FOR TROUBLESHOOTING

With the test and alignment instructions, it is possible to test the receiver and to trace the signal. On the basis of the values observed, conclusions can be drawn about defective circuit sections and defective assemblies.

Defective components or assemblies can be replaced by the proper replacement parts.

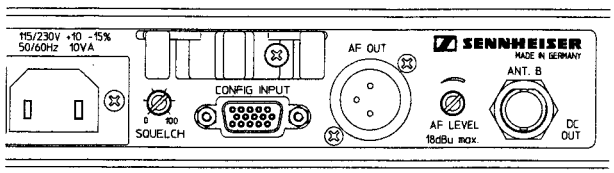
If defects are suspected in the area of the processor assembly and the display assembly, the test and alignment instructions (No. 6 - 6.4 and No. 8 - 8.2) should also be carried out. If this does not permit a clear error diagnosis, switch the receiver off and detach the flexible connection of the display assembly from the main PCB (P6). Then replace the display assembly by a functional replacement display assembly (simply plug the flexible connector into P6). If the error in the receiver is then eliminated, the display assembly has to be replaced. If the same error occurs again, replace the processor assembly and then retest the receiver for the same error.

8 MODIFIKATIONEN

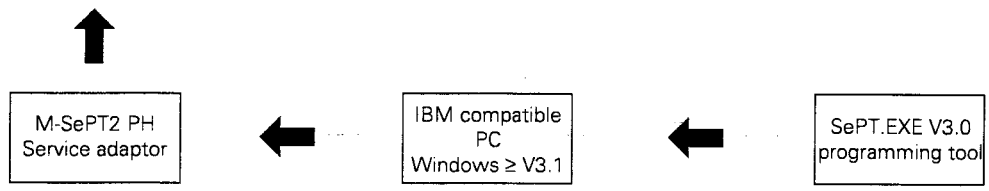
8.1 FREQUENZEN INNERHALB DER SCHALT-BANDBREITE

Achtung: Während das Programmierkabel M-SePT2 PH auf der Empfängerschnittstelle "CONFIG INPUT" gesteckt ist, nicht die Bedienelemente "SET", "UP" und "DOWN" benutzen!

1. Empfänger betriebsbereit machen; dazu Netzstecker an Stromversorgungsbuchse anschließen. Empfänger an Netzspannung anschließen.
2. Empfänger mit Betriebsschalter S1 einschalten.
3. Service-Adapter M-SePT2 PH (Bestell-Nr. 70507) mit freien COM-Port des IBM-kompatiblen PC's verbinden.
4. Service-Adapter M-SePT2 PH auf Programmierbuchse J5 (CONFIG INPUT) der Empfänger-Rückseite stecken.



Empfänger
Receiver



5. Programm SePT.EXE (ab V3.0) unter Windows starten.
6. Die Daten des EEPROM's werden ausgelesen und im Programmfenster angezeigt.
7. Die neuen Kanalfrequenzen können nun eingegeben werden. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programm-Software abgerufen werden.
8. Nach dem Programmiervorgang fragt das Programm SePT.EXE automatisch den Inhalt des EEPROM's ab.
9. Nach dem Überprüfen des gespeicherten Inhaltes kann der Service-Adapter M-SePT2 PH von der Programmierbuchse J5 entfernt werden.
10. Da sich die programmierten Frequenzen *innerhalb der bisherigen Schaltbandbreite* befinden, sind lediglich die Empfangsfrequenzen und Spezifikationen des Empfängers zu überprüfen.

8.2 FREQUENZEN AUSSERHALB DER SCHALT-BANDBREITE

Achtung: Während das Programmierkabel M-SePT2 PH auf der Empfängerschnittstelle "CONFIG INPUT" gesteckt ist, nicht die Bedienelemente "SET", "UP" und "DOWN" benutzen!

1. Empfänger betriebsbereit machen; dazu Netzstecker an Stromversorgungsbuchse anschließen. Empfänger an Netzspannung anschließen.
2. Empfänger mit Betriebsschalter S1 einschalten.
3. Service-Adapter M-SePT2 PH (Bestell-Nr. 70507) mit freien COM-Port des IBM-kompatiblen PC's verbinden.
4. Service-Adapter M-SePT2 PH auf Programmierbuchse J5 (CONFIG INPUT) der Empfänger-Rückseite stecken.

8 MODIFICATIONS

8.1 FREQUENCIES WITHIN THE SWITCHING BANDWIDTH

Attention: Do not use the switches "SET", "UP", and "DOWN" on the front panel while the programming cable M-SePT2 PH is connected to the receiver bus "CONFIG INPUT"!

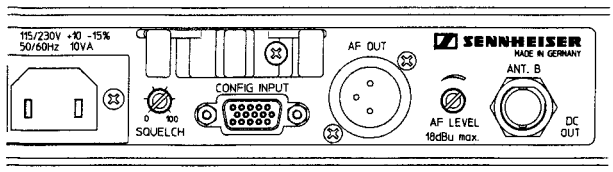
1. Put the receiver into operation (connect the mains cable to the mains power supply, connect the receiver to the mains voltage.
2. Switch the receiver on with switch S1.
3. Connect the M-SePT2 PH service adaptor (spare part no. 70507) to the unused COM port of the IBM compatible PC.
4. Connect the M-SePT2 PH service adaptor to the J5 programming socket (CONFIG INPUT) on the rear of the receiver.

5. Start the SePT.EXE programming tool (V3.0 or later) under Windows.
6. SePT.EXE reads in and displays the receiver's EEPROM data.
7. You can now enter new channel frequencies. SePT.EXE has online help. For information on how to use the software simply choose the "Help" command.
8. After programming, SePT.EXE automatically displays the EEPROM data.
9. After you have checked the stored data, remove the M-SePT2 PH service adaptor from the J5 programming socket.
10. As the programmed frequencies are *within the previous switching bandwidth*, you only have to check receiving frequencies and receiver data.

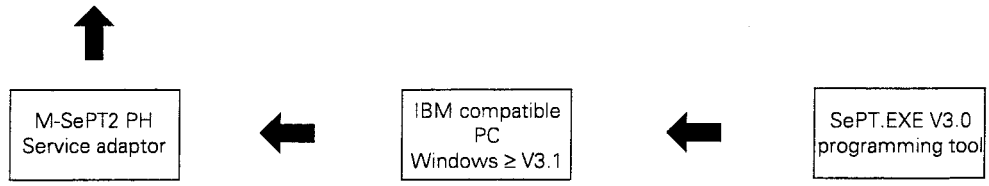
8.2 FREQUENCIES OUTSIDE THE SWITCHING BANDWIDTH

Attention: Do not use the switches "SET", "UP", and "DOWN" on the front panel while the programming cable M-SePT2 PH is connected to the receiver bus "CONFIG INPUT"!

1. Put the receiver into operation (connect the mains cable to the mains power supply, connect the receiver to the mains voltage.
2. Switch the receiver on with switch S1.
3. Connect the M-SePT2 PH service adaptor (spare part no. 70507) to the unused COM port of the IBM compatible PC.
4. Connect the M-SePT2 PH service adaptor to the J5 programming socket (CONFIG INPUT) on the rear of the receiver.



Empfänger
Receiver



5. Programm SePT.EXE (ab V3.0) unter Windows starten.
6. Die Daten des EEPROM's werden ausgelesen und im Programmfenster angezeigt.
7. Die neuen Kanalfrequenzen können nun eingegeben werden. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programm-Software abgerufen werden.

8a. *UHF-Empfänger:* Die Grenzen der Schaltbandbreite (24 MHz) können durch Halten der Tasten ALT, CTRL und gleichzeitigen Maus-Klick auf den Button "Chk Data" verändert werden. Die Grenzen der eingegebenen, neuen Schaltbandbreite müssen sich unbedingt innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden. Ebenso ist die neue Schaltbandbreite auf 24 MHz zu berechnen. Der bestückte Bereich des Tuner-Moduls ist zu erkennen an den Kodierwiderständen R501 - R505.

Bereich Nr. 1:	430 - 494 MHz	R501 bestückt
Bereich Nr. 2:	470 - 598 MHz	R502 bestückt
Bereich Nr. 3:	574 - 702 MHz	R503 bestückt
Bereich Nr. 4:	680 - 814 MHz	R504 bestückt
Bereich Nr. 5:	798 - 960 MHz	R505 bestückt

8b. *VHF-Empfänger:* Die Grenzen der Schaltbandbreite (7 MHz) können durch Halten der Tasten ALT, CTRL und gleichzeitigen Maus-Klick auf den Button "Chk Data" verändert werden. Die Grenzen der eingegebenen, neuen Schaltbandbreite müssen sich unbedingt innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden. Ebenso ist die neue Schaltbandbreite auf 7 MHz zu berechnen. Der bestückte Bereich des Tuner-Moduls ist zu erkennen an den Kodierwiderständen R501 - R504.

Bereich Nr. 1:	138 - 155 MHz	R501 bestückt
Bereich Nr. 2:	148 - 181 MHz	R502 bestückt
Bereich Nr. 3:	174 - 233 MHz	R503 bestückt
Bereich Nr. 4:	216 - 260 MHz	R504 bestückt

9. Nach dem Programmiervorgang fragt das Programm SePT.EXE automatisch den Inhalt des EEPROM's ab.
10. Nach dem Überprüfen des gespeicherten Inhaltes kann der Service-Adapter M-SePT2 PH von der Programmierbuchse J5 entfernt werden.
11. Da sich die programmierten Frequenzen *außerhalb der alten Schaltbandbreite,* aber innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden, ist ein Neuabgleich laut Prüf- und Abgleichanweisung (siehe auch Kapitel 5.3) erforderlich. Vor dem Neuabgleich erscheint auf dem Anzeige-Modul üblicherweise eine Fehlermeldung "**ERR 4**", da die Bereichsgrenzen der Tuningspannung (Prüf- und Abgleichanweisung Nr. 2.1) noch nicht abgeglichen wurden.

5. Start the SePT.EXE programming tool (V3.0 or later) under Windows.
6. SePT.EXE reads in and displays the receiver's EEPROM data.
7. You can now enter new channel frequencies. SePT.EXE has online help. For information on how to use the software simply choose the "Help" command.

8a. *UHF receiver:* The limits of the switching bandwidth (24 MHz) can be changed by holding down the ALT and CTRL keys and simultaneously clicking the "Chk Data" button. It is essential that the limits of the new switching bandwidth entered are within the limits determined by the components of the RF section (RF amplifier, VCO, buffer). Also, the new switching bandwidth has to be calculated to 24 MHz. The component side of the tuner assembly can be identified by the coded resistors R501 - R505.

Range No. 1:	430 - 494 MHz	R501 mounted
Range No. 2:	470 - 598 MHz	R502 mounted
Range No. 3:	574 - 702 MHz	R503 mounted
Range No. 4:	680 - 814 MHz	R504 mounted
Range No. 5:	798 - 960 MHz	R505 mounted

8b. *VHF receiver:* The limits of the switching bandwidth (7 MHz) can be changed by holding down the ALT and CTRL keys and simultaneously clicking the "Chk Data" button. It is essential that the limits of the new switching bandwidth entered are within the limits determined by the components of the RF section (RF amplifier, VCO, buffer). Also, the new switching bandwidth has to be calculated to 7 MHz. The component side of the tuner assembly can be identified by the coded resistors R501 - R505.

Range No. 1:	138 - 155 MHz	R501 mounted
Range No. 2:	148 - 181 MHz	R502 mounted
Range No. 3:	174 - 233 MHz	R503 mounted
Range No. 4:	216 - 260 MHz	R504 mounted

9. After programming, SePT.EXE automatically displays the EEPROM data.
10. After you have checked the stored data, remove the M-SePT2 PH service adaptor from the J5 programming socket.
11. As the programmed frequencies are outside the previous switching bandwidth but within the limits determined by the components of the RF section (RF amplifier, VCO, buffer), the receiver has to be re-aligned according to the test and alignment instructions (see also chapter 5.3). Before re-alignment, an error message "**ERR 4**" normally appears on the display assembly because the limits of the tuning voltage (test and alignment instruction No. 2.1) have not yet been adjusted.

8.3 EM 3031/32 TUNER-MODUL AUSTAUSCHEN

Achtung: Während das Programmierkabel M-SePT2 PH auf der Empfängerschnittstelle "CONFIG INPUT" gesteckt ist, nicht die Bedienelemente "SET", "UP" und "DOWN" benutzen!

Zum Abgleich und zur Reparatur ist das Gehäuse der Empfänger zu demontieren.

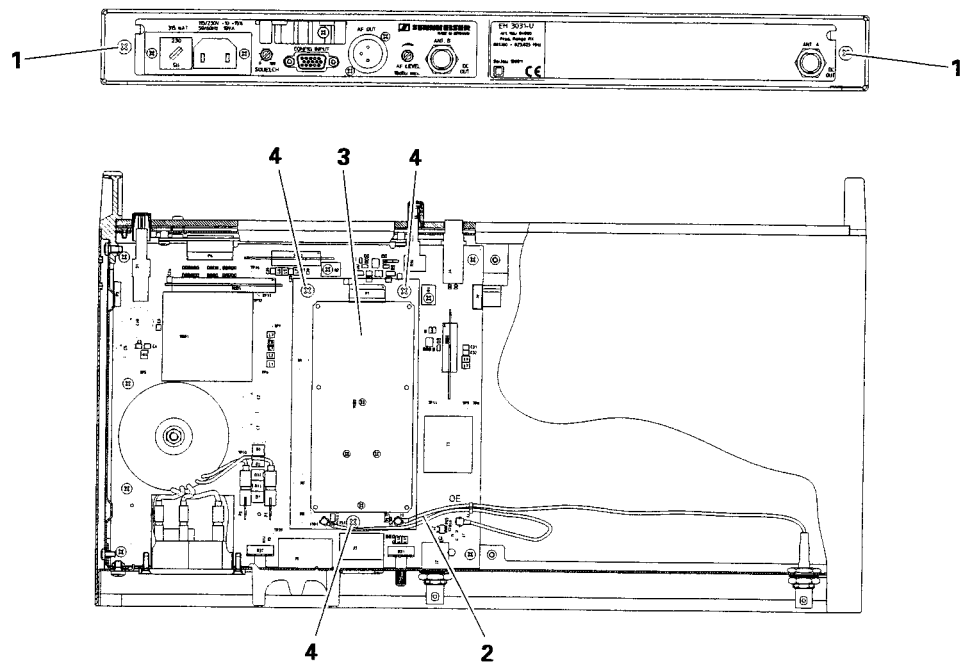
1. Gehäuse öffnen; dazu mit Schraubendreher zwei Schrauben (**1**) auf der Rückseite des Chassis lösen und entfernen. Chassis nach vorne aus dem Gehäuse ziehen.
2. Antennenkabel (**2**) von Buchsen J1 und J101 des Tuner-Moduls (**3**) lösen *(Achtung! Antennenstecker vorsichtig mit Flachzange aus den Buchsen ziehen. Stecker nicht aus den Buchsen hebeln, da Leiterplatte zerstört werden kann).*
3. Schrauben (**4**) des Tuner-Moduls lösen.
4. Tuner-Modul von Hauptplatine entnehmen.

8.3 REPLACING THE EM 3031/32 TUNER ASSEMBLY

Attention: Do not use the switches "SET", "UP", and "DOWN" on the front panel while the programming cable M-SePT2 PH is connected to the receiver bus "CONFIG INPUT"!

For alignment and repairs, the receivers have to be disassembled.

1. For opening the housing, unlock two screws (**1**) on the rear of the chassis with a screwdriver. Pull the chassis forwards out of the housing.
2. Disconnect the antenna cable (**2**) from the J1 and J101 sockets of the tuner assembly (**3**). *(Attention! The antenna connector has to carefully be plugged out of the socket with flat nose pliers. Do not lever the connector out of the socket, as this can destroy the PCB).*
3. Remove the screws (**4**) of the tuner assembly.
4. Remove the tuner assembly from the main PCB.



5. Austausch-Tuner-Modul auf Hauptplatine stecken.
6. Tuner-Modul mit Schrauben (**4**) befestigen.
7. Antennenkabel (**2**) seitenrichtig auf Tuner-Modul aufstecken (ANT. A auf J1, ANT. B auf J101).

8a. Ist das Tuner-Modul bereits abgeglichen, sind lediglich die Empfangsfrequenzen und Spezifikationen des Empfängers zu überprüfen.

8b. Ist das *UHF-Tuner-Modul A001* ein Ersatzteil vom Sennheiser Service, ist es auf eine Schaltbandbreite von 24 MHz in der Mitte des bestückten HF-Teils abgeglichen.

Bereich Nr. 1: 430 - 494 MHz abgeglichen auf 450 - 474 MHz
Bereich Nr. 2: 470 - 598 MHz abgeglichen auf 522 - 546 MHz
Bereich Nr. 3: 574 - 702 MHz abgeglichen auf 626 - 650 MHz
Bereich Nr. 4: 680 - 814 MHz abgeglichen auf 735 - 759 MHz
Bereich Nr. 5: 798 - 960 MHz abgeglichen auf 867 - 891 MHz

8c. Ist das *VHF-Tuner-Modul A012* ein Ersatzteil vom Sennheiser Service, ist es auf eine Schaltbandbreite von 7 MHz in der Mitte des bestückten HF-Teils abgeglichen.

Bereich Nr. 1: 138 - 155 MHz abgeglichen auf 143 - 150 MHz
Bereich Nr. 2: 148 - 181 MHz abgeglichen auf 161 - 168 MHz
Bereich Nr. 3: 174 - 223 MHz abgeglichen auf 195 - 202 MHz
Bereich Nr. 4: 216 - 260 MHz abgeglichen auf 234 - 241 MHz

5. Plug the replacement tuner assembly onto the main PCB.
6. Fix the tuner assembly in place with screws (**4**).
7. Fit the antenna cable (**2**) onto the tuner assembly the right way round (ANT.A to J1, ANT.B to J101).

8a. If the tuner assembly has already been aligned, you only have to check receiving frequencies and receiver data.

8b. If the *UHF tuner assembly (A001)* is a spare part from Sennheiser Service Department, it is aligned to a switching bandwidth of 24 MHz.

Range No. 1: 430 - 494 MHz aligned to 450 - 474 MHz
Range No. 2: 470 - 598 MHz aligned to 522 - 546 MHz
Range No. 3: 574 - 702 MHz aligned to 626 - 650 MHz
Range No. 4: 680 - 814 MHz aligned to 735 - 759 MHz
Range No. 5: 798 - 960 MHz aligned to 867 - 891 MHz

8c. If the *VHF tuner assembly (A012)* is a spare part from Sennheiser Service Department, it is aligned to a switching bandwidth of 7 MHz.

Range No. 1: 138 - 155 MHz aligned to 143 - 150 MHz
Range No. 2: 148 - 181 MHz aligned to 161 - 168 MHz
Range No. 3: 174 - 223 MHz aligned to 195 - 202 MHz
Range No. 4: 216 - 260 MHz aligned to 234 - 241 MHz

9. Schrauben des Abschirmdeckels lösen und entfernen.
10. Abschirmdeckel von Abschirmprofil entnehmen.
11. Empfänger mit Betriebsschalter S1 einschalten.
12. Service-Adapter M-SePT2 PH (Bestell-Nr. 70507) am freien COM-Port des IBM-kompatiblen PC's kontaktieren (siehe Abbildung unter 8.1.4).
13. Service-Adapter M-SePT2 PH auf Programmierbuchse J5 (CONFIG INPUT) der Empfänger-Rückseite stecken.
14. Programm SePT.EXE (ab V3.0) unter Windows starten.
15. Die Daten des EEPROM's werden ausgelesen und im Programmfenster angezeigt.
16. Die neuen Kanalfrequenzen können nun eingegeben werden. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programm-Software abgerufen werden.

17a. *UHF-Empfänger:* Die Grenzen der Schaltbandbreite (24 MHz) können durch Halten der Tasten ALT, CTRL und gleichzeitigen Maus-Klick auf den Button "Chk Data" verändert werden.

Die Grenzen der eingegebenen neuen Schaltbandbreite müssen sich unbedingt innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden. Ebenso ist die neue Schaltbandbreite auf 24 MHz zu berechnen. Der bestückte Bereich des Tuner-Moduls ist zu erkennen an den Kodierwiderständen R501 - R505.

Bereich Nr. 1:	430 - 494 MHz	R501 bestückt
Bereich Nr. 2:	470 - 598 MHz	R502 bestückt
Bereich Nr. 3:	574 - 702 MHz	R503 bestückt
Bereich Nr. 4:	680 - 814 MHz	R504 bestückt
Bereich Nr. 5:	798 - 960 MHz	R505 bestückt

Das Ersatz-Tuner-Modul für die Empfänger EM 3031-U und EM 3032-U ist beschrieben mit "SPARE30-U".

17b. *VHF-Empfänger:* Die Grenzen der Schaltbandbreite (7 MHz) können durch Halten der Tasten ALT, CTRL und gleichzeitigen Maus-Klick auf den Button "Chk Data" verändert werden.

Die Grenzen der eingegebenen neuen Schaltbandbreite müssen sich unbedingt innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden. Ebenso ist die neue Schaltbandbreite auf 7 MHz zu berechnen. Der bestückte Bereich des Tuner-Moduls ist zu erkennen an den Kodierwiderständen R501 - R504.

Bereich Nr. 1:	138 - 155 MHz	R501 bestückt
Bereich Nr. 2:	148 - 181 MHz	R502 bestückt
Bereich Nr. 3:	174 - 233 MHz	R503 bestückt
Bereich Nr. 4:	216 - 260 MHz	R504 bestückt

Das Ersatz-Tuner-Modul für die Empfänger EM 3031-V und EM 3032-V ist beschrieben mit "SPARE30-V".

Weitere Informationen über das Tuner-Modul sind abrufbar durch einen Mausklick auf das Fragezeichen "?". Im Anzeigefeld "Spare Part No.:" wird die Ersatzteil-Nr. des Tuner-Moduls angezeigt. Im Anzeigefeld "Model:" wird die Verwendung des Tuner-Moduls angezeigt.

18. Nach dem Programmiervorgang fragt das Programm SePT.EXE automatisch den Inhalt des EEPROM's ab.
19. Nach dem Überprüfen des gespeicherten Inhaltes kann der Service-Adapter M-SePT2 PH von der Programmierbuchse J5 entfernt werden.

9. Remove the screws from the lid of the RF screen.
10. Remove the lid.
11. Switch the receiver on with operating switch S1.
12. Connect the M-SePT2 PH service adaptor (spare part no. 70507) to the unused COM port of the IBM compatible PC (pls. see chapter 8.1.4).
13. Connect the M-SePT2 PH service adaptor to the J5 programming socket (CONFIG INPUT) on the rear of the receiver.
14. Start the SePT.EXE programming tool (V3.0 or later) under Windows.
15. SePT.EXE reads in and displays the receiver's EEPROM data.
16. You can now enter new channel frequencies. SePT.EXE has online help. For information on how to use the software simply choose the "Help" command.

17a. *UHF receiver:* The limits of the switching bandwidth (24 MHz) can be changed by holding down the ALT and CTRL keys and simultaneously clicking the "Chk Data" button.

It is essential that the limits of the new switching bandwidth entered are within the limits determined by the components of the RF section (RF amplifier, VCO, buffer). Also, the new switching bandwidth has to be calculated to 24 MHz. The component side of the tuner assembly can be identified by the coded resistors R501 - R505.

Range No. 1:	430 - 494 MHz	R501 mounted
Range No. 2:	470 - 598 MHz	R502 mounted
Range No. 3:	574 - 702 MHz	R503 mounted
Range No. 4:	680 - 814 MHz	R504 mounted
Range No. 5:	798 - 960 MHz	R505 mounted

The replacement tuner assembly for the EM 3031-U and EM 3032-U receivers is described with "SPARE30-U".

17b. *VHF receiver:* The limits of the switching bandwidth (7 MHz) can be changed by holding down the ALT and CTRL keys and simultaneously clicking the "Chk Data" button.

It is essential that the limits of the new switching bandwidth entered are within the limits determined by the components of the RF section (RF amplifier, VCO, buffer). Also, the new switching bandwidth has to be calculated to 7 MHz. The component side of the tuner assembly can be identified by the coded resistors R501 - R504.

Range No. 1:	138 - 155 MHz	R501 mounted
Range No. 2:	148 - 181 MHz	R502 mounted
Range No. 3:	174 - 233 MHz	R503 mounted
Range No. 4:	216 - 260 MHz	R504 mounted

The replacement tuner assembly for the EM 3031-V and EM 3032-V receivers is described with "SPARE30-V".

Further information on the tuner assembly can be called up by clicking the question mark "?". In the dialog box "Spare Part No.", the spare part number of the tuner assembly is displayed. In the dialog box "Model", the use of the tuner model is displayed.

18. After programming, SePT.EXE automatically displays the EEPROM data.
19. After you have checked the stored data, remove the M-SePT2 PH service adaptor from the J5 programming socket.

20. Da sich die programmierten Frequenzen *außerhalb der alten Schaltbandbreite*, aber innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden, ist ein Neuabgleich laut Prüf- und Abgleichanweisung erforderlich. Vor dem Neuabgleich erscheint auf dem Anzeige-Modul der Empfänger EM 3031 und EM 3032 üblicherweise die Fehlermeldung "**ERR 4**", da die Bereichsgrenzen der Tuningspannung (Prüf- und Abgleichanweisung Nr. 2.1) noch nicht abgeglichen wurden.

21. HF-Signalgenerator wie in der Prüf - und Abgleichanweisung beschrieben anschließen. Dazu DC-Trennadapter M10 (Bestell.-Nr. 40838) verwenden, da am Antenneneingang die Boosterspeisung liegt.

    Grundeinstellungen des HF-Signalgenerators:
    HF-Trägerfrequenz: Kanal in der Mitte der Schaltbandbreite,
    HF-Ausgangsspannung: 100 µV,
    Frequenzhub: 40 kHz,
    Modulation: 1 kHz

22. NF-Ausgang J3 mit NF-Multimeter und Oszilloskop verbinden (XLR-Buchse J3, Pin2 nach Pin3).

23. Prüf- und Abgleichanweisung durchführen.

20. As the programmed frequencies are *outside the previous switching bandwidth* but within the limits determined by the components of the RF section (RF amplifier, VCO, buffer), the receiver has to be re-aligned according to the test and alignment instructions. Before re-alignment, the error message "**ERR 4**" normally appears on the display assembly because the limits of the tuning voltage (test and alignment instruction No. 2.1) have not yet been adjusted.

21. Connect the RF signal generator as described in the test and alignment instructions. Use the M10 DC voltage isolating adaptor (spare part no. 40838), as the booster supply is applied to the antenna input.

    Basic settings of the RF signal generator:
    RF carrier frequency: channel at the middle of the receiver's switching bandwidth,
    RF output voltage: 100 µV,
    Deviation: 40 kHz,
    Modulation: 1 kHz

22. Connect AF output J3 to the AF multimeter and the oscilloscope (XLR socket J3, pin2 to pin3).

23. Carry out test and alignment instructions.

8.4 EM 3532-U TUNER-MODUL AUSTAUSCHEN

Achtung: Während das Programmierkabel M-SePT2 PH auf der Empfängerschnittstelle "CONFIG INPUT" gesteckt ist, nicht die Bedienelemente "SET", "UP" und "DOWN" benutzen!

Zum Abgleich und zur Reparatur ist das Gehäuse der Empfänger zu demontieren.

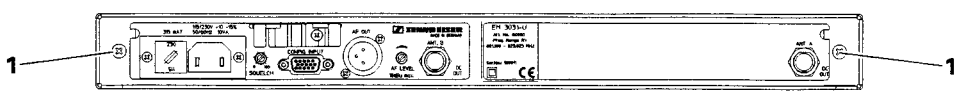
1. Gehäuse öffnen; dazu mit Schraubendreher zwei Schrauben (**1**) auf der Rückseite des Chassis entriegeln. Chassis nach vorne aus dem Gehäuse ziehen.
2. Antennenkabel (**2**) von Buchsen J1 und J101 des Tuner-Moduls (**3**) lösen *(Achtung! Antennenstecker vorsichtig mit Flachzange aus den Buchsen ziehen. Stecker nicht aus den Buchsen hebeln, da Leiterplatte zerstört werden kann).*
3. Schrauben (**4**) des Tuner-Moduls lösen.
4. Tuner-Modul von Hauptplatine entnehmen.

8.4 REPLACING THE EM 3532-U TUNER ASSEMBLY

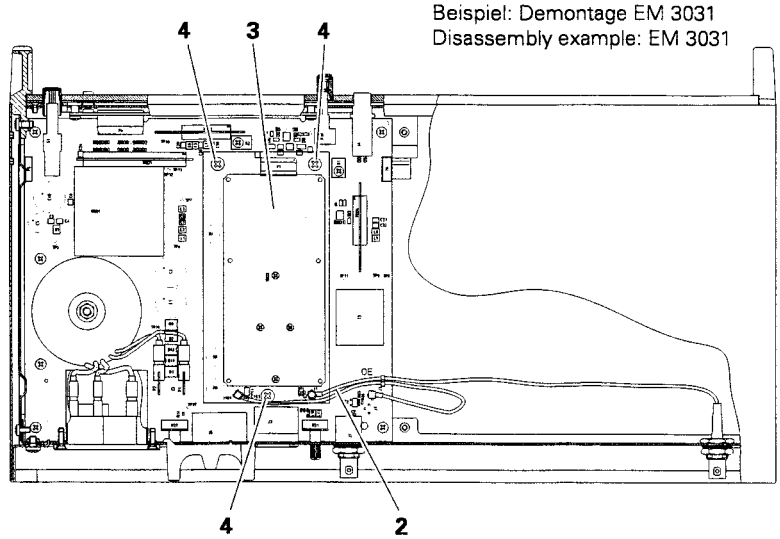
Attention: Do not use the switches "SET", "UP", and "DOWN" on the front panel while the programming cable M-SePT2 PH is connected to the receiver bus "CONFIG INPUT"!

For alignment and repairs, the receivers have to be disassembled.

1. For opening the housing, unlock two screws (**1**) on the rear of the chassis with a screwdriver. Pull the chassis forwards out of the housing.
2. Disconnect the antenna cable (**2**) from the J1 and J101 sockets of the tuner assembly (**3**). *(Attention! The antenna connector has to carefully be plugged out of the socket with flat nose pliers. Do not lever the connector out of the socket, as this can destroy the PCB).*
3. Remove the screws (**4**) of the tuner assembly.
4. Remove the tuner assembly from the main PCB.



Beispiel: Demontage EM 3031
Disassembly example: EM 3031



5. Austausch-Tuner-Modul A001 auf Hauptplatine stecken.
6. Tuner-Modul mit Schrauben (**4**) befestigen.
7. Antennenkabel (**2**) seitenrichtig auf Tuner-Modul aufstecken (ANT. A auf J1, ANT. B auf J101).

8a. Ist das Tuner-Modul bereits abgeglichen und für EM 3532 konfiguriert, sind lediglich die Empfangsfrequenzen und Spezifikationen des Empfängers zu überprüfen.

8b. Ist das *UHF-Tuner-Modul A001* ein Ersatzteil vom Sennheiser Service, ist es auf eine Schaltbandbreite von 24 MHz in der Mitte des bestückten HF-Teils abgeglichen und für den Einsatz in den Empfängern EM 3031-U und EM 3032-U konfiguriert.

Bereich Nr. 1: 430 - 494 MHz abgeglichen auf 450 - 474 MHz
Bereich Nr. 2: 470 - 598 MHz abgeglichen auf 522 - 546 MHz
Bereich Nr. 3: 574 - 702 MHz abgeglichen auf 626 - 650 MHz
Bereich Nr. 4: 680 - 814 MHz abgeglichen auf 735 - 759 MHz
Bereich Nr. 5: 798 - 960 MHz abgeglichen auf 867 - 891 MHz

9. Prozessor-Modul A014 (EM 3532-U) aus dem entsprechenden Empfänger entnehmen.
10. Prozessor-Modul A015 (EM 3031/32) in Prozessorsteckplatz des Empfängers EM 3532-U stecken.
11. Empfänger betriebbereit machen; dazu Netzstecker an Stromversorgungsbuchse anschließen. Empfänger an Netzspannung anschließen.
12. Empfänger mit Schalter S1 einschalten.
13. Service-Adapter M-SePT2 PH (Bestell-Nr. 70507) am freien COM-Port des IBM-kompatiblen PC´s kontaktieren.
14. Service-Adapter M-SePT2 PH auf Programmierbuchse J5 (CONFIG INPUT) auf der Rückseite des Empfängers RX1 stecken.
15. Programm SePT.EXE (ab V3.0) unter Windows starten.
16. Die Daten des Tuner-EEPROM´s werden ausgelesen und im Programmfenster angezeigt. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programmiersoftware abgerufen werden.
17. Im Programm-Menü unter "Options" Menü-Punkt "Make 3532" auswählen.

HINWEIS: Das Tuner-EEPROM wird nun auf die Version EM 3532-U konfiguriert. Die bereits im EEPROM abgelegten Kanalfrequenzen, sowie die Schaltbandbreite bleiben bei der Konfiguration unberührt. *EM 3532-U Tuner können nicht auf EM 3032-U Tuner rückkonfiguriert werden.*

18. Auf dem Anzeige-Modul wird ERR 1 oder ERR 3 angezeigt. Die angezeigte Fehlermeldung ist zu ignorieren.

HINWEIS: Die Fehlermeldung erfolgt aufgrund der Inkompatibilität von EM 3532-U Tuner und Prozessor-Modul A015.

19. Empfänger ausschalten und Netzstecker entfernen.
20. Prozessor-Modul A015 aus dem Empfänger entnehmen.
21. Prozessor-Modul A014 (EM 3532-U) in Prozessorsteckplatz des Empfängers stecken.
22. Netzstecker in den Empfänger einstecken.
23. Empfänger mit Betriebsschalter S1 einschalten.
24. Service-Adapter M-SePT2 PH (Bestell-Nr. 70507) am freien COM-Port des IBM-kompatiblen PC's kontaktieren.
25. Service-Adapter M-SePT2 PH auf Programmierbuchse J5 (CONFIG INPUT) der Empfänger-Rückseite stecken.

5. Plug the A001 replacement tuner assembly onto the main PCB.
6. Fix the tuner assembly in place with screws (**4**).
7. Fit the antenna cable (**2**) onto the tuner assembly the right way round (ANT.A to J1, ANT.B to J101).

8a. If the tuner assembly has already been aligned and prepared for EM 3532, you only have to check receiving frequencies and receiver data.

8b. If the *UHF tuner assembly (A001)* is a spare part from Sennheiser Service Department, it is aligned to a switching bandwidth of 24 MHz. This assembly is prepared for use in EM 3031-U and EM 3032-U receivers.

Range No. 1: 430 - 494 MHz aligned to 450 - 474 MHz
Range No. 2: 470 - 598 MHz aligned to 522 - 546 MHz
Range No. 3: 574 - 702 MHz aligned to 626 - 650 MHz
Range No. 4: 680 - 814 MHz aligned to 735 - 759 MHz
Range No. 5: 798 - 960 MHz aligned to 867 - 891 MHz

9. Remove the A014 processor assembly (EM 3532-U) from the receiver.
10. Connect an A015 processor assembly (EM 3031/32) into the processor slot of the EM 3532-U receiver.
11. Prepare the receiver for operation; plug the mains plug in the power supply socket. Connect the receiver to the mains voltage.
12. Switch on the receiver with switch S1.
13. Connect the M-SePT2 PH service adaptor (spare part no. 70507) to the unused COM port of the IBM compatible PC.
14. Connect the M-SePT2 PH service adaptor to the J5 programming socket (CONFIG INPUT) on the rear of the RX1 receiver.
15. Start the SePT.EXE programming software (V3.0 or later) under Windows.
16. SePT.EXE reads out the tuner's EEPROM data and displays them on the programming window. SePT.EXE supports online help. For information on how to use the programming software simply select the "Help" command.
17. In the programming menu, first select "Options", then select the menu item "Make 3532".

NOTE: The tuner EEPROM is now being prepared for the version EM 3532-U. All channel frequencies which have already been stored in the EEPROM and the switching bandwidth are not influenced by this configuration. *You cannot prepare EM 3532-U tuners for EM 3032-U tuners.*

18. The display assembly displays either ERR 1 or ERR 3. Ignore the displayed error message.

NOTE: The error message is displayed, as the EM 3532-U tuner and the A015 processor assembly are incompatible.

19. Switch off the receiver and disconnect the mains plug.
20. Remove the A015 processor assembly from the receiver.
21. Connect the A014 processor assembly (EM 3532-U) into the processor slot of the receiver.
22. Connect the mains plug to the receiver
23. Switch the receiver on with operating switch S1.
24. Connect the M-SePT2 PH service adaptor (spare part no. 70507) to the unused COM port of the IBM compatible PC.
25. Connect the M-SePT2 PH service adaptor to the J5 programming socket (CONFIG INPUT) on the rear of the receiver.

26. Programm SePT.EXE (ab V3.0) unter Windows starten.
27. Die Daten des EEPROM's werden ausgelesen und im Programmfenster angezeigt.
28. Die neuen Kanalfrequenzen können nun eingegeben werden. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programm-Software abgerufen werden.
29. Die Grenzen der Schaltbandbreite (24 MHz) können durch Halten der Tasten ALT, CTRL und gleichzeitigen Maus-Klick auf den Button "Chk Data" verändert werden.

    Die Grenzen der eingegebenen neuen Schaltbandbreite müssen sich unbedingt innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden. Ebenso ist die neue Schaltbandbreite auf 24 MHz zu berechnen. Der bestückte Bereich des Tuner-Moduls ist zu erkennen an den Kodierwiderständen R501 - R505.

Bereich Nr. 1:	430 - 494 MHz	R501 bestückt
Bereich Nr. 2:	470 - 598 MHz	R502 bestückt
Bereich Nr. 3:	574 - 702 MHz	R503 bestückt
Bereich Nr. 4:	680 - 814 MHz	R504 bestückt
Bereich Nr. 5:	798 - 960 MHz	R505 bestückt

    Weitere Informationen über das Tuner-Modul sind abrufbar durch einen Mausklick auf das Fragezeichen "?". Im Anzeigefeld "Spare Part No.:" wird die Ersatzteil-Nr. des Tuner-Moduls angezeigt. Im Anzeigefeld "Model:" wird die Verwendung des Tuner-Moduls angezeigt.
30. Nach dem Programmiervorgang fragt das Programm SePT.EXE automatisch den Inhalt des EEPROM's ab.
31. Nach dem Überprüfen des gespeicherten Inhaltes kann der Service-Adapter M-SePT2 PH von der Programmierbuchse J5 entfernt werden.
32. Da sich die programmierten Frequenzen *außerhalb der alten Schaltbandbreite*, aber innerhalb der Grenzen des bestückten HF-Teils (RF-Amplifier, VCO, Buffer) befinden, ist ein Neuabgleich laut Prüf- und Abgleichanweisung erforderlich. Vor dem Neuabgleich wird auf dem Anzeige-Modul des EM 3532-U dieses durch Blinken der Frequenz-/Kanalanzeige angezeigt, da die Bereichsgrenzen der Tuningspannung (Prüf- und Abgleichanweisung Nr. 2.1) noch nicht abgeglichen wurden.
33. HF-Signalgenerator wie in der Prüf - und Abgleichanweisung beschrieben anschließen. Dazu DC-Trennadapter M10 (Bestell.-Nr. 40838) verwenden, da am Antenneneingang die Boosterspeisung liegt.

    Grundeinstellungen des HF-Signalgenerators:
    HF-Trägerfrequenz: Kanal in der Mitte der Schaltbandbreite,
    HF-Ausgangsspannung: 100 µV,
    Frequenzhub: 40 kHz,
    Modulation: 1 kHz
34. NF-Ausgang J3 mit NF-Multimeter und Oszilloskop verbinden (XLR-Buchse J3, Pin2 nach Pin3, Pin1 - Masse).
35. Prüf- und Abgleichanweisung durchführen.

8.5 DC-SPEISEBUCHSE NACHRÜSTEN

Zur Nachrüstung der DC-Speisebuchse ist zu verfahren wie im Kapitel "EM 3532-U Verdrahtung, Seite 41" dargestellt. Das Nachrüstset ist erhältlich unter der Ersatzteilnummer 75528.

1. Empfängergehäuse entfernen; dazu Schrauben auf der Geräterückseite lösen.
2. Stopfen auf der Rückwand entfernen.

26. Start the SePT.EXE programming tool (V3.0 or later) under Windows.
27. SePT.EXE reads in and displays the receiver's EEPROM data.
28. You can now enter new channel frequencies. SePT.EXE has online help. For information on how to use the software simply choose the "Help" command.
29. The limits of the switching bandwidth (24 MHz) can be changed by holding down the ALT and CTRL keys and simultaneously clicking the "Chk Data" button.

    It is essential that the limits of the new switching bandwidth entered are within the limits determined by the components of the RF section (RF amplifier, VCO, buffer). Also, the new switching bandwidth has to be calculated to 24 MHz. The component side of the tuner assembly can be identified by the coded resistors R501 - R505.

Range No. 1:	430 - 494 MHz	R501 mounted
Range No. 2:	470 - 598 MHz	R502 mounted
Range No. 3:	574 - 702 MHz	R503 mounted
Range No. 4:	680 - 814 MHz	R504 mounted
Range No. 5:	798 - 960 MHz	R505 mounted

    Further information on the tuner assembly can be called up by clicking the question mark "?". In the dialog box "Spare Part No.", the spare part number of the tuner assembly is displayed. In the dialog box "Model", the use of the tuner model is displayed.
30. After programming, SePT.EXE automatically displays the EEPROM data.
31. After you have checked the stored data, remove the M-SePT2 PH service adaptor from the J5 programming socket.
32. As the programmed frequencies are *outside the previous switching bandwidth* but within the limits determined by the components of the RF section (RF amplifier, VCO, buffer), the receiver has to be re-aligned. Before re-alignment, the EM 3532-U receiver indicates this error with a blinking display because the limits of the tuning voltage (test and alignment instruction No. 2.1) have not yet been adjusted.
33. Connect the RF signal generator as described in the test and alignment instructions. Use the M10 DC voltage isolating adaptor (spare part no. 40838), as the booster supply is applied to the antenna input.

    Basic settings of the RF signal generator:
    RF carrier frequency: channel at the middle of the receiver's switching bandwidth,
    RF output voltage: 100 µV,
    Deviation: 40 kHz,
    Modulation: 1 kHz
34. Connect AF output J3 to the AF multimeter and the oscilloscope (XLR socket J3, pin2 to pin3, pin1 - GND).
35. Carry out test and alignment instructions.

8.5 RETROFITTING THE DC SUPPLY SOCKET

In order to retrofit the DC supply socket, proceed as shown in the chapter "EM 3532-U wiring, page 41". The retrofit kit is available under spare part number 75528.

1. Remove the receiver housing; for this purpose, remove the screws on the receiver's rear.
2. Remove the stopper on the rear panel.

3. Kontaktstifte P4 und P9 auf der rechten Hauptplatine (Leiterplatte mit dem Netztransformator) bestücken.
4. XLR-4 Einbaustecker mit Kreuzschlitzschrauben in der Rückwand montieren.
5. Blaues und rotes Kabel auf der Rückseite des XLR-4 Einbausteckers anlöten.

   Blaues Kabel - Pin1
   Rotes Kabel - Pin4
6. Blaues und rotes Kabel auf Kontaktstifte P4 und P9 stecken.

   Blaues Kabel - P9 - GND
   Rotes Kabel - P4 - 11-18 VDC
7. Verdrahtung der DC-Speisebuchse überprüfen (Sichtprüfung bzw. Funktionstest).
8. Empfängergehäuse auf Empfänger schieben und mit rückwärtigen Schrauben sichern.

8.6 EM 3032-U AUF EM 3532-U UPGRADEN

8.6.1 TUNER-MODULE A001 AUF EM 3532 UPGRADEN

1. Empfänger betriebsbereit machen; dazu Netzstecker an Stromversorgungsbuchse anschließen. Empfänger an Netzspannung anschließen.
2. Empfänger RX1 und RX2 einschalten.
3. Service-Adapter M-SePT2 PH (Bestell-Nr. 70507) am freien COM-Port des IBM-kompatiblen PC's kontaktieren.
4. Service-Adapter M-SePT2 PH auf Programmierbuchse J5 (CONFIG INPUT) auf der Rückseite des Empfängers RX1 stecken.
5. Programm SePT.EXE (ab V3.0) unter Windows starten.
6. Die Daten des Tuner-EEPROM's werden ausgelesen und im Programmfenster angezeigt. Das Programm SePT.EXE unterstützt die Online-Hilfe. Mit der "Help"-Funktion können somit Informationen über die Bedienung der Programmiersoftware abgerufen werden.
7. Im Programm-Menü unter "Options" Menü-Punkt "Make 3532" auswählen.

   HINWEIS: Das Tuner-EEPROM wird auf die Version 3532-U konfiguriert. Die bereits im EEPROM abgelegten Kanalfrequenzen, sowie die Schaltbandbreite bleiben bei der Konfiguration unberührt. *EM 3532-U Tuner können nicht auf EM 3032-U Tuner rückkonfiguriert werden.*
8. Auf dem Anzeige-Modul wird ERR 1 oder ERR 3 angezeigt. Die angezeigte Fehlermeldung ist zu ignorieren.

   HINWEIS: Die Fehlermeldung erfolgt aufgrund der Inkompatibilität von EM 3532-U Tuner und Prozessor-Modul A015.
9. Bei Empfänger RX2 verfahren wie bei Empfänger RX1.
10. Service-Adapter M-SePT2 PH von Empfänger RX2 entfernen.
11. Empfänger RX1 und RX2 ausschalten.
12. Netzstecker aus Stromversorgungsbuchse entfernen.

8.6.2 MECHANISCHE MODIFIKATION

1. Empfängergehäuse entfernen; dazu Schrauben auf der Geräterückseite lösen und entfernen.
2. DC-Speisebuchse nachrüsten (siehe Kapitel "8.5 Nachrüsten der DC-Speisebuchse, Abschnitt 2 bis 7).

3. Mount the P4 and P9 connector pins on the right main PCB (PCB with mains transformer).
4. Fix the XLR-4 flush-mounting plug to the rear panel with Phillips screws.
5. Solder the red and the blue cable to the rear of the XLR-4 flush-mounting plug.

   Blue cable - pin1
   Red cable - pin4
6. Connect blue and red cable to P4 and P9 connector pins.

   Blue cable - P9 - GND
   Red cable - P4 - 11-18 VDC
7. Check the wiring of the DC supply socket (visual check and functional check, respectively).
8. Carefully slide the receiver housing over the receiver and fix it with the rear screws.

8.6 UPGRADING OF EM 3032-U TO EM 3532-U

8.6.1 UPGRADING A001 TUNER ASSEMBLIES TO EM 3532

1. Prepare the receiver for operation; plug the mains plug in the power supply socket. Connect the receiver to the mains voltage.
2. Switch on the RX1 and RX2 receivers.
3. Connect the M-SePT2 PH service adaptor (spare part no. 70507) to the unused COM port of the IBM compatible PC.
4. Connect the M-SePT2 PH service adaptor to the J5 programming socket (CONFIG INPUT) on the rear of the RX1 receiver.
5. Start the SePT.EXE programming software (V3.0 or later) under Windows.
6. SePT.EXE reads out the tuner's EEPROM data and displays them on the programming window. SePT.EXE supports online help. For information on how to use the programming software simply select the "Help" command.
7. In the programming menu, first select "Options", then select the menu item "Make 3532".

   NOTE: The tuner EEPROM is now being prepared for the version EM 3532-U. All channel frequencies which have already been stored in the EEPROM and the switching bandwidth are not influenced by this configuration. *You cannot prepare EM 3532-U tuners for EM 3032-U tuners.*
8. The display assembly displays either ERR 1 or ERR 3. Ignore the displayed error message.

   NOTE: The error message is displayed, as the EM 3532-U tuner and the A015 processor assembly are incompatible.
9. Proceed in the same way for the RX2 receiver.
10. Remove the M-SePT2 PH service adaptor from the RX2 receiver.
11. Switch off the RX1 and RX2 receivers.
12. Remove the mains plug from the mains supply socket.

8.6.2 MECHANICAL MODIFICATION

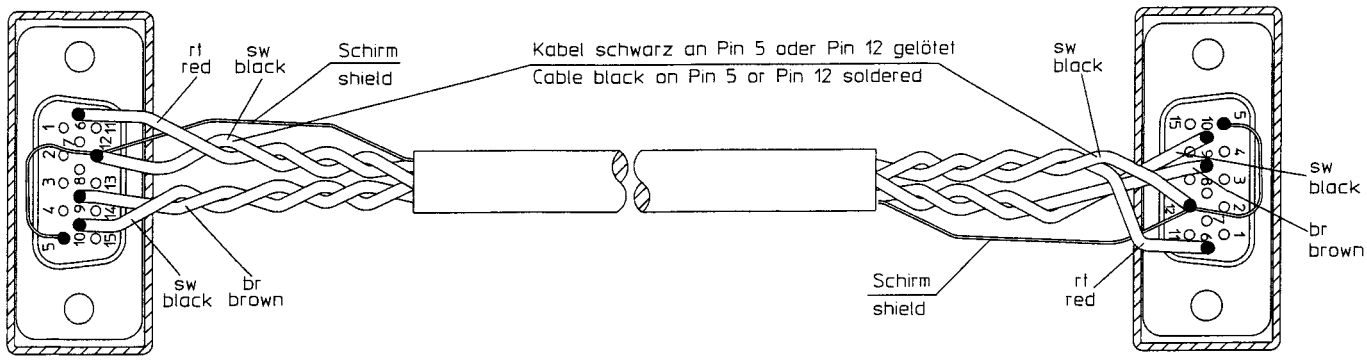
1. Remove the receiver housing; for this purpose, remove the screws on the receiver's rear.
2. Retrofit the DC supply socket (see chapter "8.5 Retrofitting the DC Supply Socket", steps 2 to 7).

3. Griffe entfernen; dazu Schrauben von rechtem und linken Seitenblech lösen.
4. Prozessor-Module A015 (ASSY5) aus Empfänger RX1 und RX2 entnehmen.
5. Lautstärke-Knöpfe von der Frontblende entfernen; dazu Kappen abziehen und Schrauben im Knopf lösen.
6. Schrauben von Seitenblechen zur Rückwand lösen und entfernen.
7. Schrauben von Hauptleiterplatten zum Frontprofil lösen und entfernen.
8. Schrauben von rechter Hauptleiterplatte zum rechten Seitenblech lösen und entfernen.
9. Anzeige-Module A006 von Frontprofil lösen; dazu Schrauben lösen und entfernen.
10. Flexverbinder der Anzeige-Module A006 von Leiste P6 der Hauptleiterplatten lösen.
11. Up, Down und Set-Knöpfe aus Frontblende entnehmen.
12. Frontblende aus Frontprofil schieben.
13. Neue Frontblende "EM 3532" in Frontprofil schieben.
14. Up, Down und Set-Knöpfe von hinten in Frontprofil einsetzen. Dabei ist zu beachten, daß die Knöpfe ca. 2 mm aus der Frontblende herausragen.
15. Anzeige-Module A006 auf Frontprofil verschrauben. Anschließend Sitz der Knöpfe überprüfen.
16. Flexverbinder der Anzeige-Module A006 in Leiste P6 der Hauptleiterplatten stecken.
17. Bedienelemente der Hauptleiterplatten in Frontprofil einführen.
18. Seitenbleche mit Rückwand verschrauben.
19. Hauptleiterplatten mit Frontprofil verschrauben.
20. Rechte Hauptleiterplatte mit rechtem Seitenblech verschrauben.
21. Lautstärke-Knöpfe montieren. Anschließend Kappen auf Knöpfe stecken.
22. Griffe montieren; dazu Schrauben im rechten und linken Seitenblech verschrauben.
23. Squelch-Einsteller auf der Rückseite des Empfängers auf Position "0" stellen.
24. Steckwellen aus beiden Squelch-Einstellern entnehmen.
25. Löcher der Squelch-Einsteller mit Blindstopfen verschließen.
26. Prozessor-Module A014 in Empfänger RX1 und RX2 einstecken.
27. Typenschild mit Seriennummer auf Rückwand kleben.
28. Empfänger RX1 und RX2 laut Prüf- und Abgleichanweisung (Punkt 9. - 10.) überprüfen.

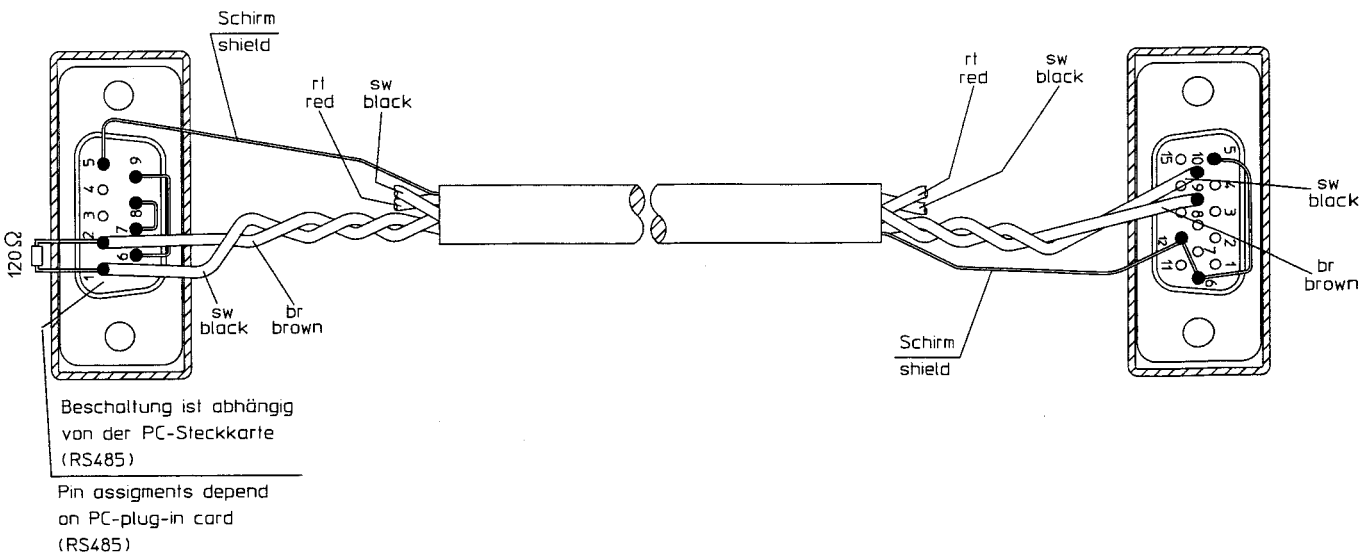
3. Remove the handles; for this purpose, loosen the screws on the left side and the right side of the side panel.
4. Remove the A015 (ASSY5) processor assemblies from the RX1 and RX2 receivers.
5. Remove the volume control knobs from the front panel; for this purpose, remove the caps and loosen the screws in the knob.
6. Loosen and remove the screws fixing the side panel to the rear panel.
7. Loosen and remove the screws fixing the main PCBs to the front profile.
8. Loosen and remove the screws fixing the right main PCB to the right side panel.
9. Loosen the A006 display assemblies from the front profile; for this purpose, loosen and remove the screws.
10. Loosen the A006 display assemblies' flexible connectors from the P6 rail of the main PCB.
11. Remove the "Up", "Down", and "Set" knobs from the front panel.
12. Carefully push the front panel out of the front profile.
13. Carefully insert the new "EM 3532" front panel into the front profile.
14. Insert the "Up", "Down", and "Set" knobs into the front profile from the rear. The knobs must project approx. 2 mm from the front panel.
15. Fix the A006 display assemblies to the front profile by means of screws. Subsequently, check that the knobs are mounted correctly.
16. Plug the flexible connectors of the A006 display assemblies in the P6 rail of the main PCBs.
17. Insert the switches of the main PCBs into the front profile.
18. Fix the side panels to the rear panel with screws.
19. Fix the main PCBs to the front profile with screws.
20. Fix the right main PCB to the right side panel with screws.
21. Mount the volume control knobs. Subsequently, slide the caps onto the knobs.
22. Mount the handles by fixing them to the left and right side panels with screws.
23. Set the squelch adjuster on the receiver's rear to position "0".
24. Remove the plug-in shafts from both squelch adjusters.
25. Close the squelch adjuster mounting holes with dummy stoppers.
26. Plug the A014 processor assemblies in the RX1 and RX2 receivers.
27. Apply the nameplate with the serial number to the rear panel.
28. Perform all test and alignment instructions to check the RX1 and RX2 receivers (steps 9 and 10).

8.7 VERDRAHTUNG FÜR S-MCD BETRIEB

8.7 WIRING FOR S-MCD OPERATION



KX 3500, ARTIKELNUMMER 04619, VERDRAHTUNGSPLAN
KX 3500, CATALOG NUMBER 04619, WIRING DIAGRAM



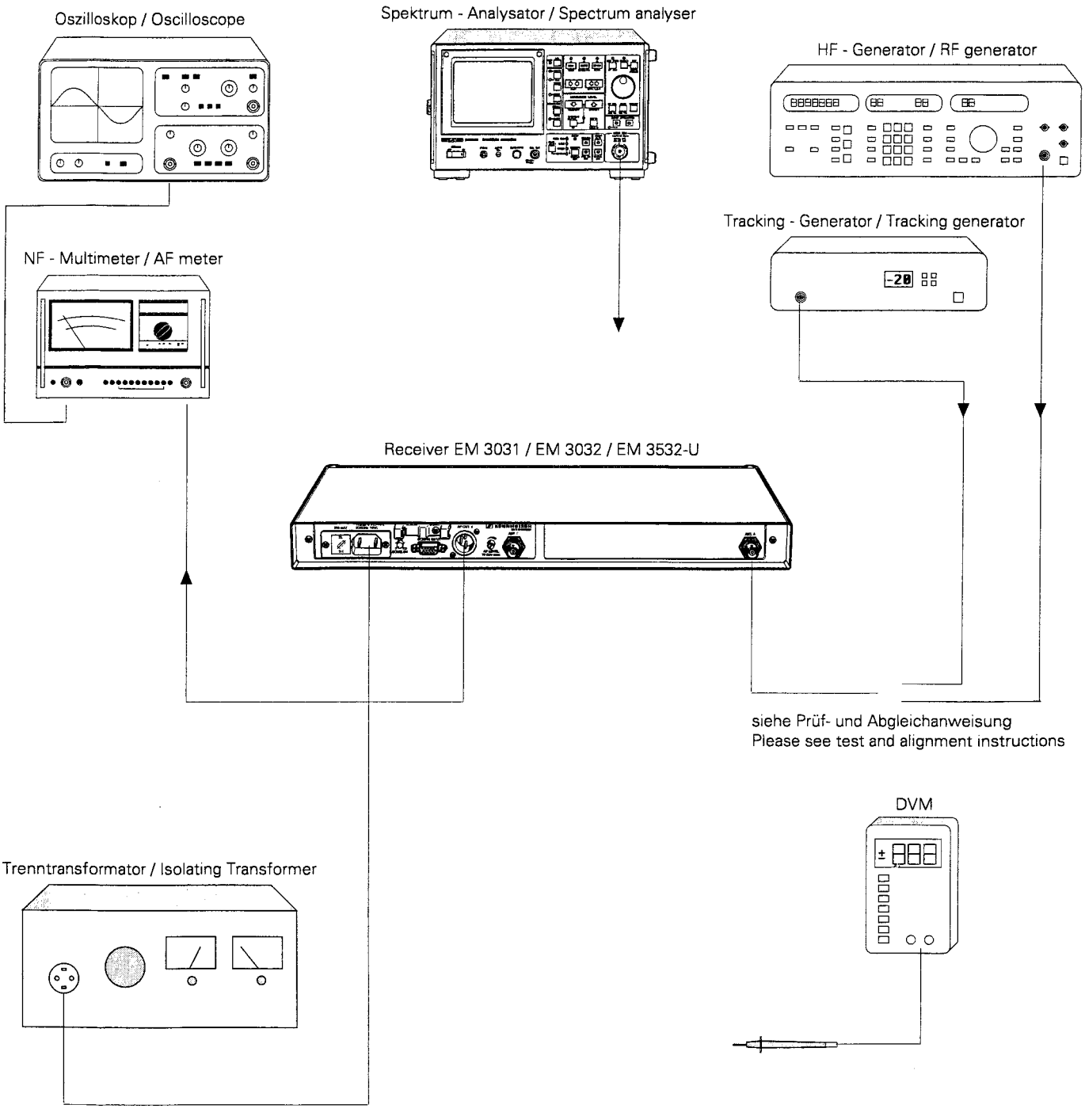
EM 3532-U/PC KABEL, ERSATZTEILNUMMER 75525, VERDRAHTUNGSPLAN
EM 3532-U/PC CABLE, SPARE PART NUMBER 75525, WIRING DIAGRAM

9 PRÜF- UND ABGLEICHANWEISUNG

9.1 MESSAUFBAU

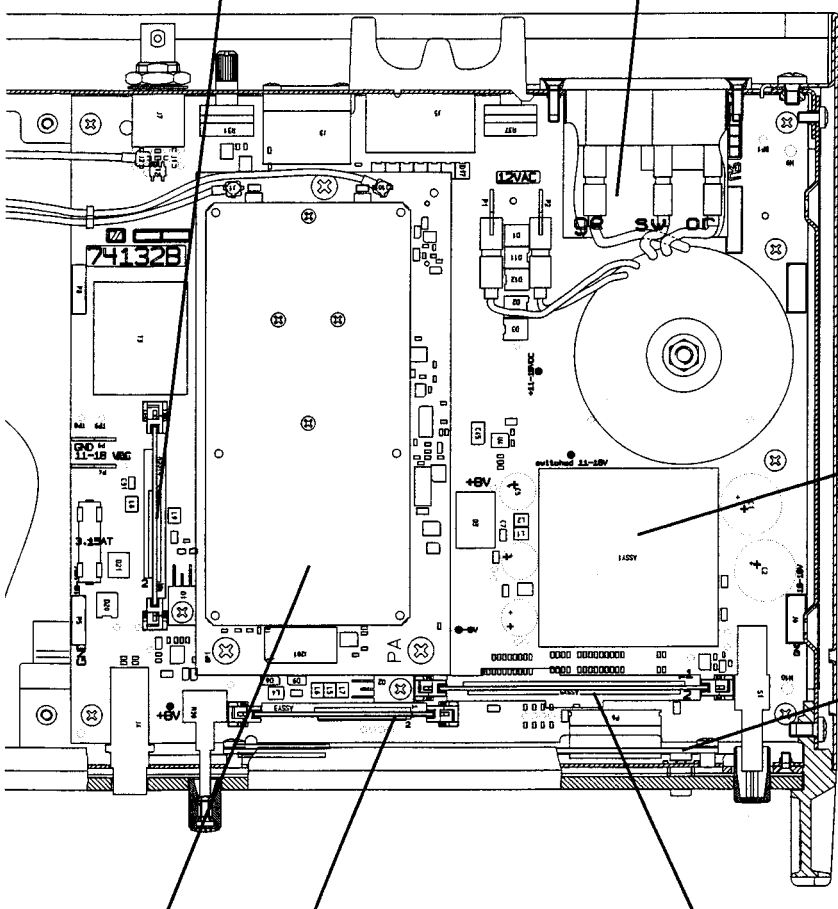
9 TEST AND ALIGNMENT INSTRUCTIONS

9.1 TEST SET-UP


Oszilloskop / Oscilloscope
Spektrum - Analysator / Spectrum analyser
HF - Generator / RF generator
Tracking - Generator / Tracking generator
NF - Multimeter / AF meter
Receiver EM 3031 / EM 3032 / EM 3532-U
siehe Prüf- und Abgleichanweisung
Please see test and alignment instructions
DVM
Trenntransformator / Isolating Transformer

NOTIZEN:

NOTES:


HDP-MODUL (Kapitel 17)
HDP ASSEMBLY (chapter 17)
HAUPTPLATINE (Kapitel 11)
MAIN PCB (chapter 11)
DC/DC-MODUL (Kapitel 19)
DC/DC ASSEMBLY (chapter 19)
ANZEIGE-MODUL (Kapitel 18)
DISPLAY ASSEMBLY (chapter 18)
SCHALT-MODUL (Kapitel 16)
DIVERSITY ASSEMBLY (chapter 16)
TUNER-MODUL (Kapitel 14 und 20)
TUNER ASSEMBLY (chapter 14 and 20)
PROZESSOR-MODUL (Kapitel 21 und 22)
PROCESSOR ASSEMBLY (chapter 21 and 22)

9.3 PRÜF- UND ABGLEICHANWEISUNG

Nr.	Messung, Einstellung	Signal-einspeisung	Vorbereitung, Geräteeinstellung	Meßpunkt	Sollwert	Einsteller	Bemerkungen
1	Inbetriebnahme	-	Netzspannung über Trenntrafo anlegen; S1 "ON", R37 "SQUELCH = 0", R31 "AF LEVEL = max." R30 "Headph. = min."				
			TESTPUNKTE AUF DER HAUPTPLATINE				
1.1	Betriebsspannung (+ 17 VDC)	-	DC - Voltmeter	TP10 TP11 - GND	+ 17 ± 0,5 VDC		
1.2	Betriebsspannung (+ 5 VDC)	-	DC - Voltmeter	TP5	+ 5 ± 0,2 VDC		
1.3	Betriebsspannung (+ 8 VDC)	-	DC - Voltmeter	TP6	+ 8 ± 0,2 VDC		
1.4	Betriebsspannung (- 8 VDC)	-	DC - Voltmeter	TP7	- 8 (- 0,2 + 1) VDC		
1.5	Boosterspeisung A Strombegrenzung	-	Antennenbuchse (ANT A) kurzschließen; DC - Voltmeter	TP2 nach TP1	155 ± 25 mV		
1.6	Boosterspeisung B Strombegrenzung	-	Antennenbuchse (ANT B) kurzschließen; DC - Voltmeter	TP4 nach TP1	155 ± 25 mV		
			TESTPUNKTE AUF DEM TUNER-MODUL				
1.7	Betriebsspannung PLL (+ 5 VDC)	-	DC - Voltmeter	U204 / Pin8	+ 5 ± 0,2 VDC		
2	Max. negative Tuningspannung	-	Mit Schalter "SET" und "DOWN" auf unterste Empfangsfrequenz schalten; DC - Voltmeter	TP10	- 4,0 VDC		
2.1	Bereichsgrenzen der Tuning-spannung	-	Mit Schalter "SET", "UP" und "DOWN" auf oberste und unterste Empfangsfrequenz schalten; DC - Voltmeter	TP20	- 2,0 ...+ 3,8 VDC	C211	Regelsteilheit **UHF (Modul A001):** 5 - 11 MHz / V **VHF (Modul A012):** 1,25 MHz / V
3	1. Oszillator (Pegel)	-	Mit Schalter "SET" und "UP" auf mittlere Frequenz des Empfangs-bereiches einstellen; Spektrum - Analysator	TP30	**UHF (Modul A001):** - 33 ...- 21 dBm **VHF (Modul A012):** - 15 ...- 5 dBm	C228	
3.1	1. Oszillator (Frequenz)	-	wie 3; Frequenzmeßgerät	TP30	**UHF (Modul A001):** FE - ZF (65,75 MHz) **VHF (Modul A012):** FE - ZF (10,7 MHz) Tol. ± 200 Hz	C256	FE - Empfangsfrequenz ZF - Zwischenfrequenz
3.2	**UHF (Modul A001):** 2. Oszillator (Frequenz)	-	Spektrum - Analysator: CF: 76,45 MHz, SPAN: 10 kHz, RBW: 1 kHz	TP3 oder TP103	76,45 MHz, Tol. ± 3 kHz	T4	Kern von T4 eindrehen, bis Frequenzsprung zu sehen ist. Kern langsam herausdrehen, bis Frequenz auf Sollfrequenz springt. Anschließend Kern noch 1/2 Drehung weiter herausdrehen. Abgleich durch Aus- und Einschalten überprüfen. Eventuell Abgleich wiederholen
3.3	**UHF (Modul A001):** 2. Oszillator-Buffer (Pegel Kanal A)	-	Spektrum - Analysator	TP3	76,45 MHz: max. Pegel, - 34 ...- 26 dBm 65,75 MHz: ca. - 32 ...- 24 dBm	T2 -	

3.4	**UHF (Modul A001):** 2. Oszillator-Buffer (Pegel Kanal B)	-	Spektrum - Analysator	TP103	76,45 MHz: max. Pegel, - 34 ...- 26 dBm 65,75 MHz: ca. - 32 ...- 24 dBm	T102 -	
4	HF - Eingang Kanal A	**UHF (Modul A001):** HF-Signalgenerator an ANT A: Auf Mittenfrequenz und Bereichsgrenzen abgleichen (HF bis auf ca. 5 µV verringern) **VHF (Modul A012):** Tracking-Generator - 47 dBm an ANT A	NF - Voltmeter, Oszilloskop Spektrum - Analysator	J3 TP1	**UHF (Modul A001):** B: ca. 24 MHz, min. Rauschen, max. NF-Pegel **VHF (Modul A012):** B: 7 MHz, - 67 ...- 57 dBm	C4, C10, C15 C3, C15, C19, C23	**Boosterspeisung !** Signaleinspeisung an die Antenneneingänge mit DC-Trennadapter M10 (Best.-Nr. 40838) siehe Abbildung 1
4.1	HF - Eingang Kanal B	**UHF (Modul A001):** HF-Signalgenerator an ANT B: Auf Mittenfrequenz und Bereichsgrenzen abgleichen (HF bis auf ca. 5 µV verringern) **VHF (Modul A012):** Tracking-Generator - 47 dBm an ANT B	NF - Voltmeter, Oszilloskop Spektrum - Analysator	J3 TP101	**UHF (Modul A001):** B: ca. 24 MHz, min. Rauschen, max. NF-Pegel **VHF (Modul A012):** B: 7 MHz, - 67 ...- 57 dBm	C104, C110, C115 C103, C115, C119, C123	 siehe Abbildung 1

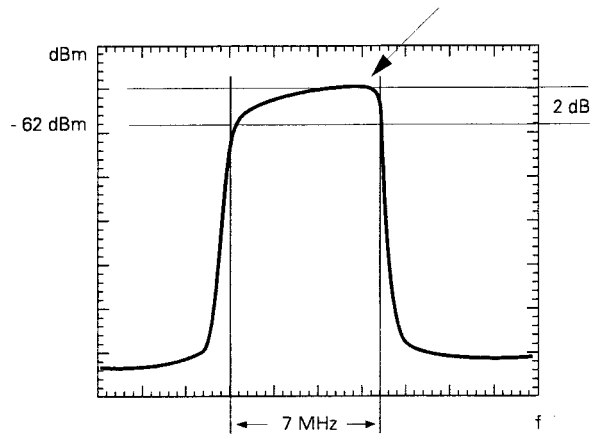


Abbildung 1
nur VHF (Modul A012)

5	ZF - Verstärker und Demodulator Kanal A	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	Oszilloskop	D202 / Pin3	siehe Abbildung 2	ASSY1 ZF-Modul A002 / L3	
5.1	ZF - Verstärker und Demodulator Kanal B	HF-Signalgenerator an ANT B: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	Oszilloskop	D202 / Pin4	siehe Abbildung 2	ASSY2 ZF-Modul A002 / L3	

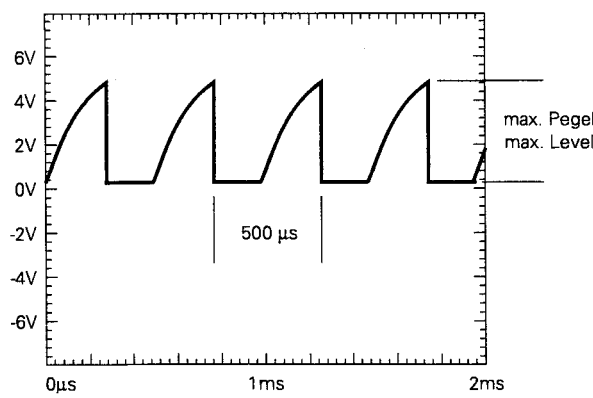


Abbildung 2

5.2	Demodulator Kanal A (Pegel)	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	J201 / Pin15	775 mVeff	ASSY1 ZF-Modul A002 / R22	
5.3	Demodulator Kanal B (Pegel)	HF-Signalgenerator an ANT B: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	J201 / Pin9	775 mVeff	ASSY2 ZF-Modul A002 / R22	

TESTPUNKTE AUF DEM SCHALT-MODUL

6	Diversity Schalter DIV SW	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	DC - Voltmeter	P7	ca. 5 VDC (Logisch HI)		LCD Anzeige U1 zeigt "ANT A" an
6.1	Diversity Schalter DIV SW	HF-Signalgenerator an ANT B: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	DC - Voltmeter	P7	ca. 0 VDC (Logisch LO)		LCD Anzeige U1 zeigt "ANT B" an
6.2	Rauschsperre SQUELCH ZERO und SQUELCH 180	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 30 µV, Hub: 40 kHz, Mod: 1 kHz	DC - Voltmeter	 P6 P8	 P6 ≠ P8 Logisch HI (LO) Logisch LO (HI)		Im Regelfall ist P8 (SQUELCH 180) das logisch aktive Signal. In Ausnahmefällen kann P6 (SQUELCH ZERO) aktiv sein. Dieses ist abhängig von der Oszillatorlage (ober- oder unterhalb der Empfangsfrequenz) und wird vom Mikro-prozessor gesteuert
6.3	Rauschsperre SQUELCH ZERO und SQUELCH 180	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 30 µV, Hub: 40 kHz, Mod: 1 kHz	R37 "SQUELCH = max"; DC - Voltmeter	 P6 P8	 Logisch HI Logisch HI		LCD Anzeige U1 zeigt "MUTE" an
6.4	Batterie - Indikator	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 3 kHz, Mod: 5 Hz	R37 "SQUELCH = min"; Oszilloskop: Volt Div. - 2 V Time Div. - 20 ms	P9	siehe Abbildung 3		Dieser Test dient der Überprüfung des Signalwegs. Eine Aussage über die Auswertung eines codierten Signales läßt sich mit dieser Simulation nicht machen.

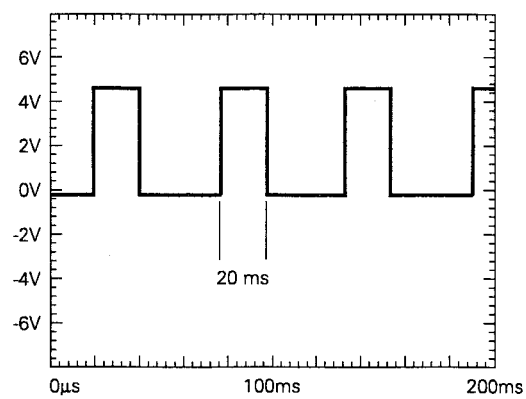


Abbildung 3

6.5	NF - Ausgang (Pegel)	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	P19	775 mVeff		

TESTPUNKTE AUF DEM HDP-MODUL							
7	NF - Eingang (Pegel)	wie 6.5	NF - Voltmeter, Oszilloskop	P1	775 mVeff		
7.1	NF - Ausgang (+) AF+ OUT	wie 7	NF - Voltmeter, Oszilloskop	P19	1,6 Veff		
7.2	NF - Ausgang (-) AF- OUT	wie 7.1	NF - Voltmeter, Oszilloskop	P20	1,6 Veff		
7.3	Aussteueranzeige DEV (100 %)	wie 7.2	DC - Voltmeter	P21	3 VDC		LCD Anzeige U1 zeigt "DEV 100 %" an
7.4	Aussteueranzeige DEV (PEAK)	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 56 kHz, Mod: 1 kHz	DC - Voltmeter	P21	4,5 VDC		LCD Anzeige U1 zeigt "DEV PEAK" an
TESTPUNKTE AUF DEM PROZESSOR-MODUL							
8	Prozessor - Takt	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 40 kHz, Mod: 1 kHz	Tastkopf 10 : 1, Frequenzmeßgerät, Oszilloskop	U3 / Pin 10	4 MHz		
8.1	Prozessor - Reset	wie 8	DC - Voltmeter	P3	ca. 5 VDC (Logisch HI)		
8.2	Prozessor-Modul - LCD-Modul (Datendiagramme)	wie 8.1	Oszilloskop	P18, P19, P20, P22	siehe Abbildung 4		

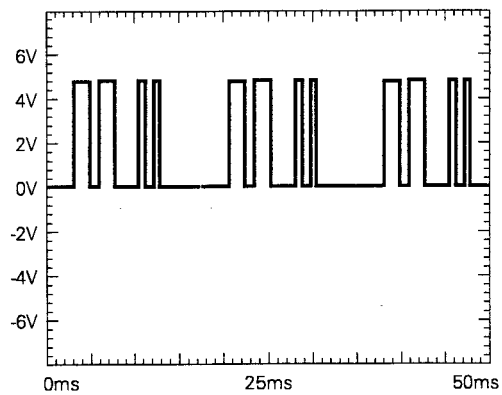


Abbildung 4

TESTPUNKTE AUF DER HAUPTPLATINE							
9	NF - Ausgang (Nennhub)	wie 8.2	R31 "AF LEVEL = max."; NF - Voltmeter, Oszilloskop	J3	12 dBu ± 1 dB		
9.1	NF - Ausgang (Spitzenhub)	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 100 µV, Hub: 56 kHz, Mod: 1 kHz	wie 9	J3	17,5 dBu ± 1 dB		
9.2	Empfindlichkeit Kanal A	HF-Signalgenerator an ANT A: Empfangsfrequenz, EM 3031: 3,0 µV, EM 30/3532: 4,5 µV Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter (Fremdspannung), Oszilloskop	J3	≥ 74 dBu Fremd eff		An der oberen und unteren Grenze der Schaltbandbreite beträgt die Empfindlichkeit: ≥ 68 dBu Fremd eff
9.3	Empfindlichkeit Kanal B	HF-Signalgenerator an ANT B: Empfangsfrequenz, EM 3031: 3,0 µV, EM 30/3532: 4,5 µV Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter (Fremdspannung), Oszilloskop	J3	≥ 74 dBu Fremd eff		An der oberen und unteren Grenze der Schaltbandbreite beträgt die Empfindlichkeit: ≥ 68 dBu Fremd eff

9.4	Signal - / Rausch-abstand Kanal A	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	J3	≥ 110 dB Fremd eff. ≥ 114 dB A - bewertet ≥ 100 dB CCIR peak		
9.5	Signal - / Rausch-abstand Kanal B	HF-Signalgenerator an ANT B: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz	NF - Voltmeter, Oszilloskop	J3	≥ 110 dB Fremd eff. ≥ 114 dB A - bewertet ≥ 100 dB CCIR peak		
9.6	Klirrfaktor Kanal A	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz	Klirrfaktormeßgerät, Oszilloskop	J3	kges. < 0,5 %		
9.7	Klirrfaktor Kanal B	HF-Signalgenerator an ANT B: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 1 kHz	Klirrfaktormeßgerät, Oszilloskop	J3	kges. < 0,5 %		
9.8	NF - Frequenzgang Kanal A (ohne Preemphasis)	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 400 Hz	NF - Voltmeter, Oszilloskop	J3	entspricht 0 dB		
9.9	NF - Frequenzgang Kanal A	Mod: 40 Hz; sonst wie 9.8	wie 9.8	J3	≤ - 3 dB		
9.10	NF - Frequenzgang Kanal A	Mod: 20 kHz; sonst wie 9.9	wie 9.9	J3	- 30 ... - 34 dB		
9.11	NF - Frequenzgang Kanal B (ohne Preemphasis)	HF-Signalgenerator an ANT B: Empfangsfrequenz, HF: 1 mV, Hub: 40 kHz, Mod: 400 Hz	NF - Voltmeter, Oszilloskop	J3	entspricht 0 dB		
9.12	NF - Frequenzgang Kanal B	Mod: 40 Hz; sonst wie 9.8	wie 9.11	J3	≤ - 3 dB		
9.13	NF - Frequenzgang Kanal B	Mod: 20 kHz; sonst wie 9.9	wie 9.12	J3	- 30 ... - 34 dB		
10	NF - Monitorsignal	HF-Signalgenerator an ANT A: Empfangsfrequenz, HF: 1 mV, Hub: 8 kHz, Mod: 1 kHz	R30 "Headph. = max. unverzerrtes Signal"; NF - Voltmeter, Oszilloskop	J4	max. Ausgangspegel (unterhalb der Begrenzung) 15 dBu ± 3 dB		

NOTIZEN:

9.3 TEST AND ALIGNMENT INSTRUCTIONS

No.	Measurement, adjustment	Signal input	Preparations, settings	Test point	Desired value	Adjust with	Remarks
1	Putting the receiver into operation	-	Supply mains voltage via an isolating transformer; S1 "ON", R37 "SQUELCH = 0", R31 "AF LEVEL = max." R30 "Headph. = min."				
			TEST POINTS ON MAIN PCB				
1.1	Operating voltage (+ 17 VDC)	-	DC voltmeter	TP10 TP11 - GND	+ 17 ± 0.5 VDC		
1.2	Operating voltage (+ 5 VDC)	-	DC voltmeter	TP5	+ 5 ± 0.2 VDC		
1.3	Operating voltage (+ 8 VDC)	-	DC voltmeter	TP6	+ 8 ± 0.2 VDC		
1.4	Operating voltage (- 8 VDC)	-	DC voltmeter	TP7	- 8 (- 0.2 + 1) VDC		
1.5	Power supply for antenna booster A, current limiting	-	Short-circuit (ANT A); DC voltmeter	TP2 to TP1	155 ± 25 mV		
1.6	Power supply for antenna booster B, current limiting	-	Short-circuit (ANT B); DC voltmeter	TP4 to TP1	155 ± 25 mV		
			TEST POINTS ON TUNER ASSEMBLY				
1.7	Operating voltage PLL (+ 5 VDC)	-	DC voltmeter	U204 / pin8	+ 5 ± 0.2 VDC		
2	Max. negative tuning voltage	-	Use "SET" and "DOWN" to switch to lowest receiving frequency; DC voltmeter	TP10	- 4.0 VDC		
2.1	Limits of tuning voltage	-	Use "SET", "UP" and "DOWN" to switch to highest and lowest receiving frequencies; DC voltmeter	TP20	- 2.0 ...+ 3.8 VDC	C211	Rate of frequency rise **UHF assembly A001:** 5 - 11 MHz / V **VHF assembly A012:** 1.25 MHz / V
3	1st oscillator (RF level)	-	Use "SET" and "UP" to switch to medium receiving frequency of switching bandwidth; spectrum analyser	TP30	**UHF assembly A001:** - 33 ...- 21 dBm **VHF assembly A012:** - 15 ...- 5 dBm	C228	
3.1	1st oscillator (frequency)	-	as 3; frequency meter	TP30	**UHF assembly A001:** RF - IF (65.75 MHz) **VHF assembly A012:** RF - IF (10.7 MHz) tol. ± 200 Hz	C256	RF - receiver frequency IF - intermediate frequency
3.2	**UHF assembly A001:** 2nd oscillator (frequency)	-	Spectrum analyser: CF: 76.45 MHz, SPAN: 10 kHz, RBW: 1 kHz	TP3 or TP103	76.45 MHz, tol. ± 3 kHz	T4	Turn the core of T4 in until a frequency peak occurs. Now move the core out slowly until the frequency reaches the required value. Then make another 1/2 turn. Turn the receiver off and on again and check the adjustment. If necessary, repeat the alignment.
3.3	**UHF assembly A001:** Buffer of 2nd oscillator (level, channel A)	-	Spectrum analyser	TP3	76.45 MHz: max. level, - 34 ...- 26 dBm; 65.75 MHz: approx. - 32 ...- 24 dBm;	T2 -	
3.4	**UHF assembly A001:** Buffer of 2nd oscillator (level, channel B)	-	Spectrum analyser	TP103	76.45 MHz: max. level, - 34 ...- 26 dBm; 65.75 MHz: approx. - 32 ...- 24 dBm;	T102 -	

4	RF input channel A	**UHF assembly A001:** RF signal generator at ANT A: mid, upper, and lower frequency, decrease RF to 5 µV **VHF assembly A012:** Tracking generator - 47 dBm at ANT A	AF voltmeter, oscilloscope Spectrum analyser	J3 TP1	**UHF assembly A001:** B: approx. 24 MHz min. Noise, max. AF level **VHF assembly A012:** B: 7 MHz, approx. - 67...- 57 dBm	C4, C10, C15 C3, C15, C19, C23	**Power supply for antenna booster !** Feed signals to the antenna inputs via M 10 DC isolating adaptor (spare part no. 40838) see illustration 1
4.1	RF input channel B	**UHF assembly A001:** RF signal generator at ANT B: mid, upper, and lower frequency, decrease RF to 5 µV **VHF assembly A012:** Tracking generator - 47 dBm at ANT B	AF voltmeter, oscilloscope Spectrum analyser	J3 TP101	**UHF assembly A001:** B: approx. 24 MHz min. Noise, max. AF level **VHF assembly A012:** B: 7 MHz, approx. - 67...- 57 dBm	C104, C110, C115 C103, C115, C119, C123	see illustration 1

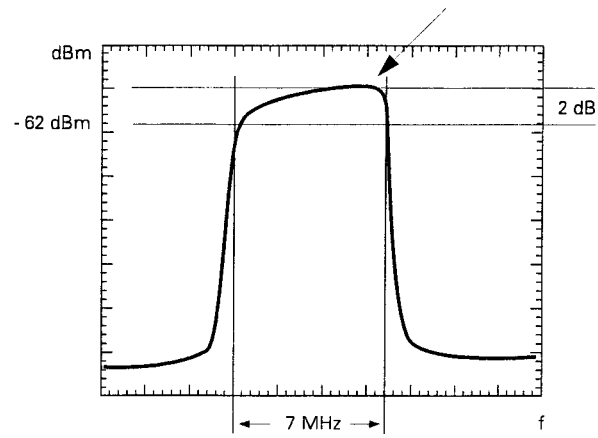


Illustration 1
VHF assembly A012 only

5	IF amplifier and demodulator, channel A	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	Oscilloscope	D202 / pin3	see illustration 2	ASSY1 IF assembly A002 / L3	
5.1	IF amplifier and demodulator, channel B	RF signal generator at ANT B: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	Oscilloscope	D202 / pin4	see illustration 2	ASSY2 IF assembly A002 / L3	

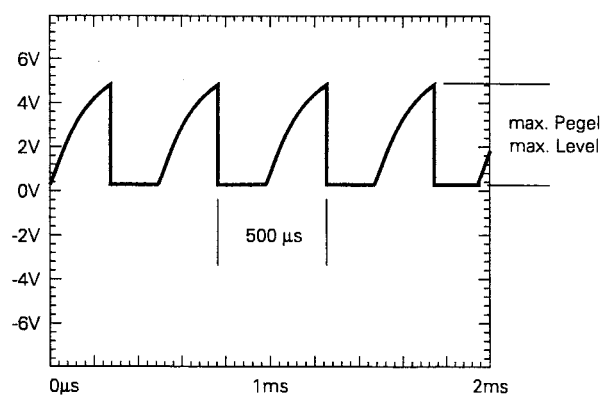


Illustration 2

5.2	Demodulator channel A (level)	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	AF voltmeter, oscilloscope	J201 / pin15	775 mVeff	ASSY1 IF assembly A002 / R22	
5.3	Demodulator channel B (level)	RF signal generator at ANT B: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	AF voltmeter, oscilloscope	J201 / pin9	775 mVeff	ASSY2 IF assembly A002 / R22	
	TEST POINTS ON DIVERSITY ASSEMBLY						
6	Diversity switch DIV SW	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	DC voltmeter	P7	approx. 5 VDC (logical HI)		U1 LC display indicates "ANT A"
6.1	Diversity switch DIV SW	RF signal generator at ANT B: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	DC voltmeter	P7	approx.. 0 VDC (logical LO)		U 1 LC display indicates "ANT B"
6.2	Squelch SQUELCH ZERO and SQUELCH 180	RF signal generator at ANT A: receiving frequency, RF: 30 µV, dev.: 40 kHz, mod.: 1 kHz	DC voltmeter	 P6 P8	P6 ≠ P8 logical HI (LO) logical LO (HI)		Usually, P8 (SQUELCH 180) is the logically active signal. In exceptional cases, P6 (SQUELCH ZERO) may be active. This depends on whether the oscillator frequency is above or below the receiving frequency and is controlled by the microprocessor.
6.3	Squelch SQUELCH ZERO and SQUELCH 180	RF signal generator at ANT A: receiving frequency, RF: 30 µV, dev.: 40 kHz, mod.: 1 kHz	R37 "SQUELCH = max"; DC voltmeter	 P6 P8	 logical HI logical HI		U1 LC display indicates "MUTE"
6.4	Battery status display	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 3 kHz, mod.: 5 Hz	R37 "SQUELCH = min"; oscilloscope: Volt div. - 2 V Time div. - 20 ms	P9	see illustration 3		This test serves to check the signal path. This simulation cannot establish whether a coded signal is correctly evaluated or not.

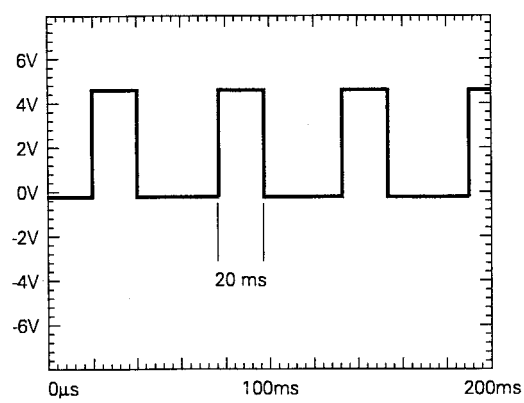


Illustration 3

6.5	AF output (level)	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	AF voltmeter, oscilloscope	P19	775 mVeff		

			TEST POINTS ON HDP ASSEMBLY				
7	AF input (level)	as 6.5	AF voltmeter, oscilloscope	P1	775 mVeff		
7.1	AF output (+) AF+ OUT	as 7	AF voltmeter, oscilloscope	P19	1.6 Veff		
7.2	AF output (-) AF- OUT	as 7.1	AF voltmeter, oscilloscope	P20	1.6 Veff		
7.3	Deviation display DEV (100 %)	as 7.2	DC voltmeter	P21	3 VDC		U1 LC display indicates "DEV 100 %"
7.4	Deviation display DEV (PEAK)	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 56 kHz, mod.: 1 kHz	DC voltmeter	P21	4.5 VDC		U1 LC display indicates "DEV PEAK"
			TEST POINTS ON PROCESSOR ASSEMBLY				
8	Clock pulse of processor	RF signal generator at ANT A: receiving frequency, RF: 100 µV, dev.: 40 kHz, mod.: 1 kHz	10 : 1 probe, frequency meter, oscilloscope	U3 / pin 10	4 MHz		
8.1	Processor reset	as 8	DC voltmeter	P3	approx. 5 VDC (logical HI)		
8.2	Processor assembly - LCD assembly (data diagrams)	as 8.1	Oscilloscope	P18, P19, P20, P22	see illustration 4		

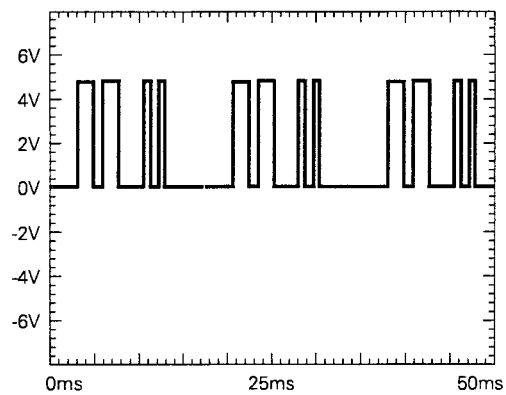


Illustration 4

			TEST POINTS ON MAIN PCB				
9	AF output (nominal deviation)	as 8.2	R31 "AF LEVEL = max."; AF voltmeter, oscilloscope	J3	12 dBu ± 1 dB		
9.1	AF output (peak deviation)	RF signal generator at ANT A: receiving frequency RF: 100 µV, dev.: 56 kHz, mod.: 1 kHz	as 9	J3	1.5 dBu ± 1 dB		
9.2	Sensitivity channel A	RF signal generator at ANT A: receiving frequency, EM 3031: 3.0 µV, EM 30/3532: 4.5 µV dev.: 40 kHz, mod.: 1 kHz	AF voltmeter (unweighted), oscilloscope	J3	≥ 74 dBu eff, unweighted		At the upper and lower limits of the switching bandwidth, the sensitivity is: ≥ 68 dBu eff, unweighted
9.3	Sensitivity channel B	RF signal generator at ANT B: receiving frequency, EM 3031: 3.0 µV, EM 30/3532: 4.5 µV, dev.: 40 kHz, mod.: 1 kHz	AF voltmeter (unweighted), oscilloscope	J3	≥ 74 dBu eff, unweighted		At the upper and lower limits of the switching bandwidth, the sensitivity is: ≥ 68 dBu eff, unweighted

9.4	Signal-to-noise ratio channel A	RF signal generator at ANT A: receiving frequency, RF: 1 mV, dev.: 40 kHz, mod.: 1 kHz	AF voltmeter, oscilloscope	J3	≥ 110 dB unweighted ≥ 114 dB A-weighted ≥ 100 dB CCIR peak		
9.5	Signal-to-noise ratio channel B	RF signal generator at ANT B: receiving frequency, RF: 1 mV, dev.: 40 kHz, mod.: 1 kHz	AF voltmeter, oscilloscope	J3	≥ 110 dB unweighted ≥ 114 dB A-weighted ≥ 100 dB CCIR peak		
9.6	THD channel A	RF signal generator at ANT A: receiving frequency, RF: 1 mV, dev.: 40 kHz, mod.: 1 kHz	THD meter, oscilloscope	J3	overall THD < 0.5 %		
9.7	THD channel B	RF signal generator at ANT B: receiving frequency, RF: 1 mV, dev.: 40 kHz, mod.: 1 kHz	THD meter, oscilloscope	J3	overall THD < 0.5 %		
9.8	AF frequency response channel A (without pre-emphasis)	RF signal generator at ANT A: receiving frequency, RF: 1 mV, dev.: 40 kHz, mod.: 400 Hz	AF voltmeter, oscilloscope	J3	corresponds to 0 dB		
9.9	AF frequency response channel A	mod.: 40 Hz; otherwise as 9.8	as 9.8	J3	≤ - 3 dB		
9.10	AF frequency response channel A	mod.: 20 kHz; otherwise 9.9	as 9.9	J3	- 30 ... - 34 dB		
9.11	AF frequency response channel B (without pre-emphasis)	RF signal generator at ANT B: receiving frequency, RF: 1 mV, dev.: 40 kHz, mod.: 400 Hz	AF voltmeter, oscilloscope	J3	corresponds to 0 dB		
9.12	AF frequency response channel B	mod.: 40 Hz; otherwise as 9.8	as 9.11	J3	≤ - 3 dB		
9.13	AF frequency response channel B	mod.: 20 kHz; otherwise as 9.9	as 9.12	J3	- 30 ... - 34 dB		
10	AF monitoring signal	RF signal generator at ANT A: receiving frequency, RF: 1 mV, dev.: 8 kHz, mod.: 1 kHz	Set R30 (volume control for headphone output) to maximum non-distorted signal; AF voltmeter, oscilloscope	J4	max. output level (below output voltage limit) 15 dBu ± 3 dB		

NOTES:

10 BAUGRUPPENTRÄGER

10.1 ALLGEMEINES

Die Geräte EM 3031,EM 3032 und EM 3532 sind Empfänger in 19" Bauweise und dienen als Gegenstation für drahtlose Mikrofone. Sie sind sowohl als Einzelempfänger (EM 3031) als auch als Doppelempfänger (EM 3032, EM 3532) konzipiert und auch für Mehrkanalanlagen einzusetzen.

Der mechanische Aufbau erfolgt in einem 19" Einschub mit einer Höheneinheit (1 HE). Für den Betrieb als Tischgerät werden die mitgelieferten Gummifüße angebracht und die 19" Montageteile entsprechend weggelassen.

Auf der Frontseite sind (beim Doppelempfänger getrennt) als Bedienungselemente der Einschalter, drei Programmiertaster, der Lautstärkesteller für die Mithörlautstärke und eine 6,3 mm Klinkenbuchse für den Mithörausgang angeordnet. Als zentrale Kontrolleinrichtung ist auf der Frontseite ein hinterleuchtetes LC-Display vorhanden, auf dem alle wichtigen Informationen angezeigt werden.

Die Rückseite des Gerätes enthält einen Kaltgerätestecker mit integriertem Spannungswähler (115/230 V) und Feinsicherung und zwei HF-Eingangsbuchsen. Je Empfänger befinden sich AF-Ausgangsbuchse mit Pegelsteller, Programmierbuchse und ein Einsteller für den Squelchpegel auf der Rückseite (Ausnahme EM 3532).

Der innere Aufbau besteht je Empfänger aus einer Basisleiterplatte auf der die einzelnen Funktionsblöcke als Module untergebracht sind. Bis auf den DC/DC-Wandler und die ZF-Bausteine sind alle Module auf der Grundplatte gesteckt. Detaillierte Informationen zu den einzelnen Funktionsblöcken befinden sich in den Modulbeschreibungen.

10.2 GEHÄUSE

Das Gehäuse besteht aus 3 Komponenten:

a) einem Montagerahmen für die Leiterplatten (wahlweise für eine oder zwei),
b) einer Frontbaugruppe und
c) einem Umgehäuse

10.2.1 BESCHREIBUNG

Der Aufbau des Gerätes ist so gestaltet, daß wichtige Funktionsmerkmale auffällig sind:

Das Gerät entspricht einem 19-Zoll-Einbaugehäuse mit einer Höheneinheit.
Durch Anschrauben zweier Winkel an den Mantel ist das Gerät "rackfähig".
Durch Entfernen von zwei Schrauben an der Rückwand (Lochblende) sind Mantelgehäuse und Montagerahmen mit Frontbaugruppe trennbar.
Die eingebaute Hauptplatine ist im Servicefalle von beiden Seiten zugänglich.
Der Montagerahmen bietet Platz für eine oder zwei Leiterplatten.
Es besteht die Möglichkeit, daß die beiden Antennen, die in der Rückwand ihren Anschluß haben, nach vorne zur Front verlängert werden können.

10 MAINFRAME

10.1 GENERAL

The EM 3031,EM 3032 and EM 3532 receivers together with the suitable hand-held and pocket transmitters permit wireless sound transmission with studio quality. The EM 3031 is a 32-channel true diversity receiver in a 19" 1 U rack housing, whereas the EM 3032 and EM 3532 consists of two complete 32-channel true diversity receivers in a single 19" 1 U rack housing.The EM 3031,EM 3032 and EM 3532 are suitable for multi-channel applications.

With the two supplied rack mount ears, the receiver can be mounted into a 19" rack. For use as a stand-alone receiver, the supplied rubber feet are stuck into the recesses at the bottom of the receiver and the rack mount ears are omitted.

The receiver's front side features the following operating controls and connectors (2 x for the EM 3032, EM 3532): on/off switch, three programming buttons, headphone volume control and a 1/4" (6.3 mm) Ø headphone socket. A backlit LCD display on the front displays all the important information.

The rear side of the receiver features a 2-pin IEC mains connector with an integral mains voltage selector (115/230 V) and a fine wire fuse and two RF inputs. Each receiver has an AF output with level control, a service/programming socket and a squelch control (except EM 3532).

The internal structure of each receiver consists of a main PCB on which the individual functional blocks are housed in the form of assemblies. Except for the DC/DC converter and IF assemblies all other assemblies are plugged into the main board. Detailed information on the individual functional blocks can be found in the assembly descriptions.

10.2 HOUSING

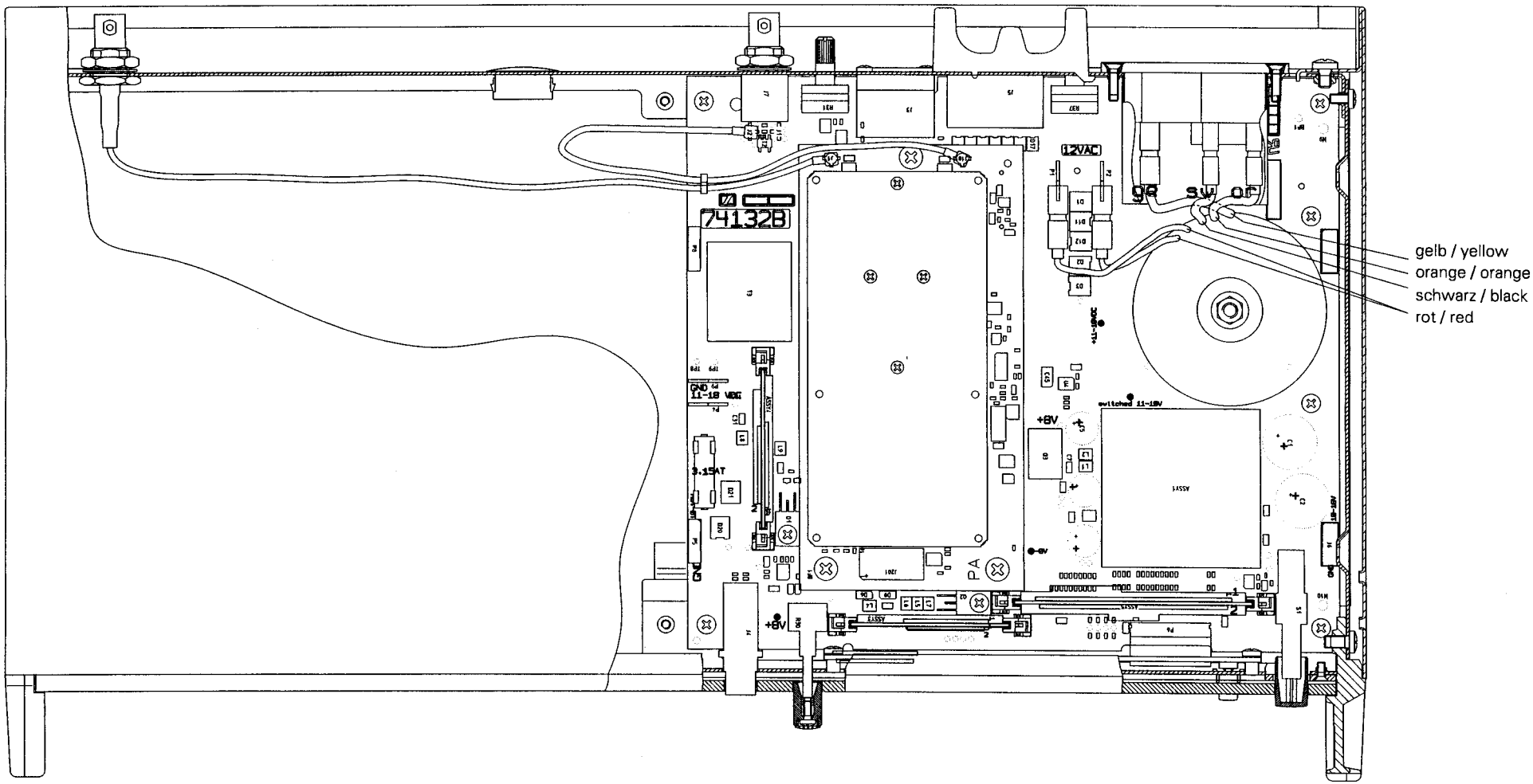
The housing consists of 3 parts:

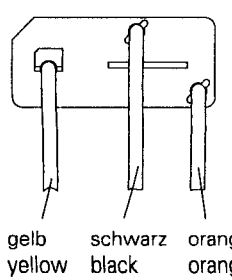
a) a mounting frame for the PCBs (optionally for one or two),
b) a front assembly, and
c) a housing

10.2.1 DESCRIPTION

The receiver is designed such that important functional features are prominent.

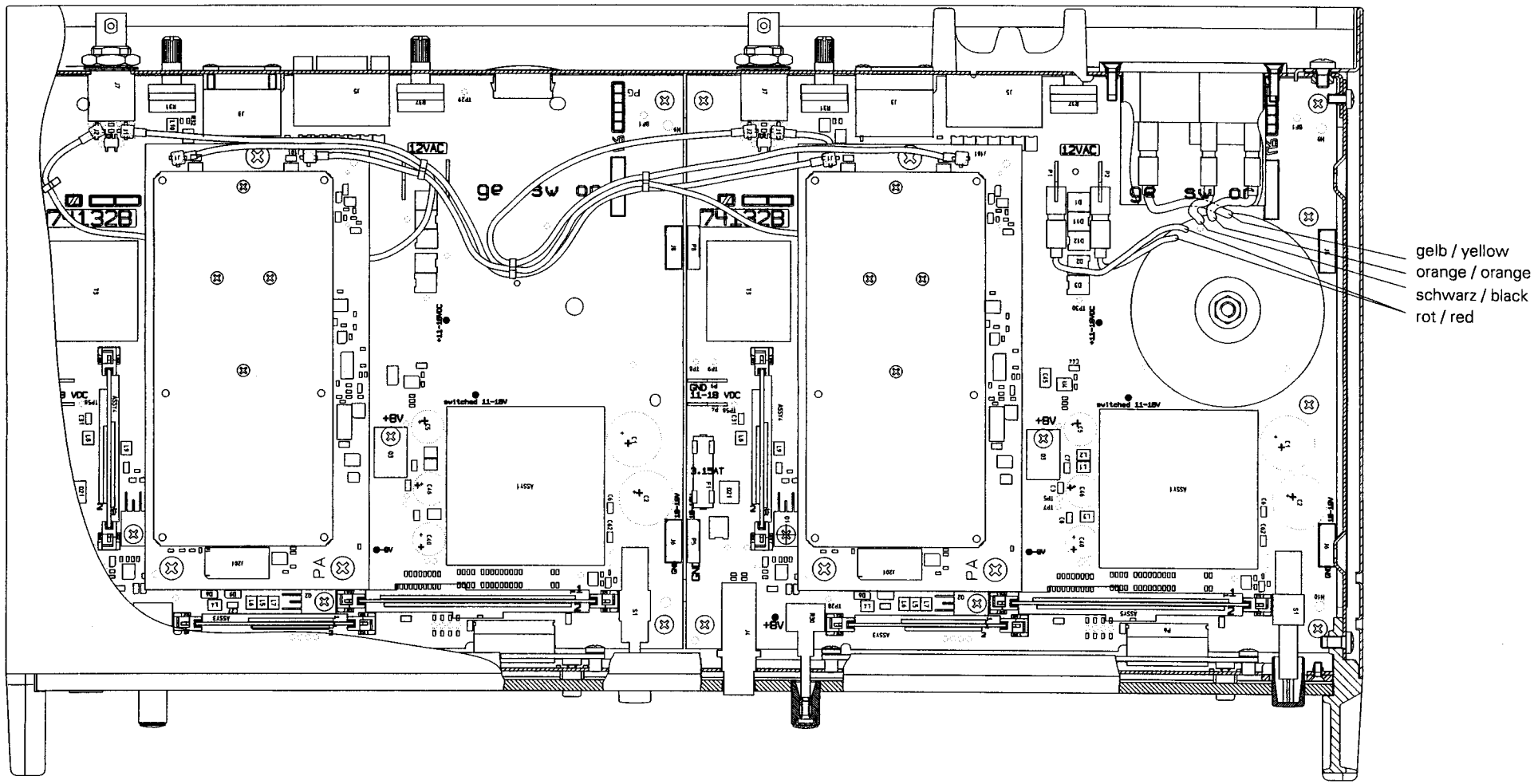
With the two supplied rack mount ears, the receiver can be mounted into a 19" 1U rack housing.
By removing two screws from the rear panel (perforated panel), the housing and the mounting frame with the front assembly can be separated.
The main PCB is accessible from both sides.
The mounting frame offers space for one or two PCBs.
The two antennæ which are connected to the rear of the receiver can be extended to the front.

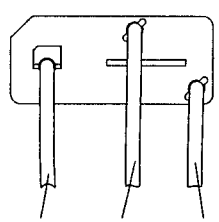




Netzstecker
Mains plug

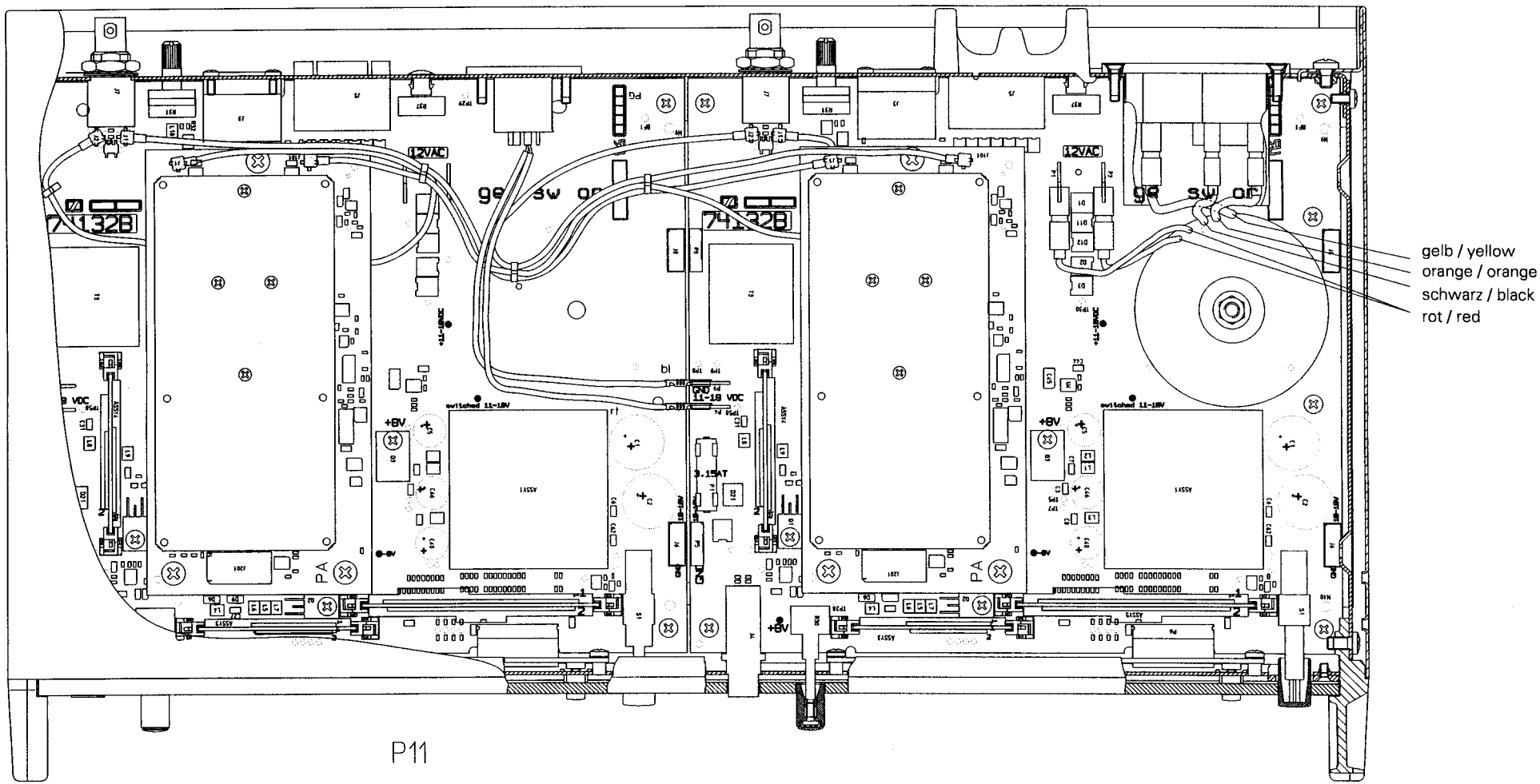
EM 3031, VERDRAHTUNG
EM 3031, WIRING

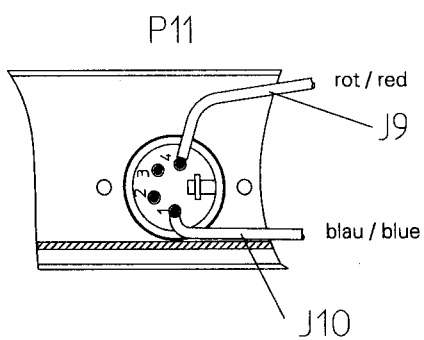




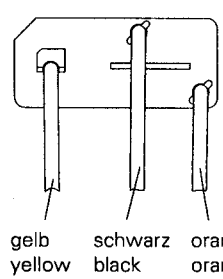
Netzstecker
Mains plug

EM 3032, VERDRAHTUNG
EM 3032, WIRING





DC-Eingangsbuchse
DC input socket



Netzstecker
Mains plug

EM 3532-U, VERDRAHTUNG
EM 3532-U, WIRING

11 HAUPTPLATINE

11.1 BESCHREIBUNG

Die Hauptplatine mit den Abmessungen 208 x 190 mm dient als Trägerplatine für einen kompletten Empfänger.
Sie nimmt sämtliche Module und Schnittstellen zu externen Anschlüssen, sowie Bedien- und Anzeigeelemente auf.
Außerdem liefert sie die Stromversorgung für alle auf ihr befindlichen Elemente und Module.
Bei der Doppelempfänger-Ausführung (EM 3032, EM 3532) wird auch die zweite Grundplatine (ohne Netzteil), von der ersten mit Gleichspannung versorgt.

11.2 SPEZIFIKATIONEN

Mech. Abmessungen 208 x 190 mm

Anschlüsse, Bedienung, Anzeige

Front
1. 6,35mm-Klinke, unsym. NF-Ausgang
2. Pegelsteller für Mithörausgang
3. Multifunktionsanzeige
4. Ein-/Ausschalter

Rückseite
5. BNC, HF-Eingänge
6. Pegel-Einsteller für sym. NF-Ausgang (XLR)
7. Squelch-Pegelsteller
8. Kaltgerätestecker mit Sicherung
9. Programmierbuchse
10. XLR-Ausgangbuchse

NOTIZEN:

11 MAIN BOARD

11.1 DESCRIPTION

The main PCB with the dimensions 208 x 190 mm serves as a carrier circuit board for a complete receiver.
It accommodates all assemblies and all interfaces to external connections as well as all operating elements and displays.
It also powers the elements and assemblies mounted on it.

In the EM 3032 and EM 3532, the 2nd main PCB (without mains unit) is supplied with direct current by the 1st main PCB.

11.2 SPECIFICATIONS

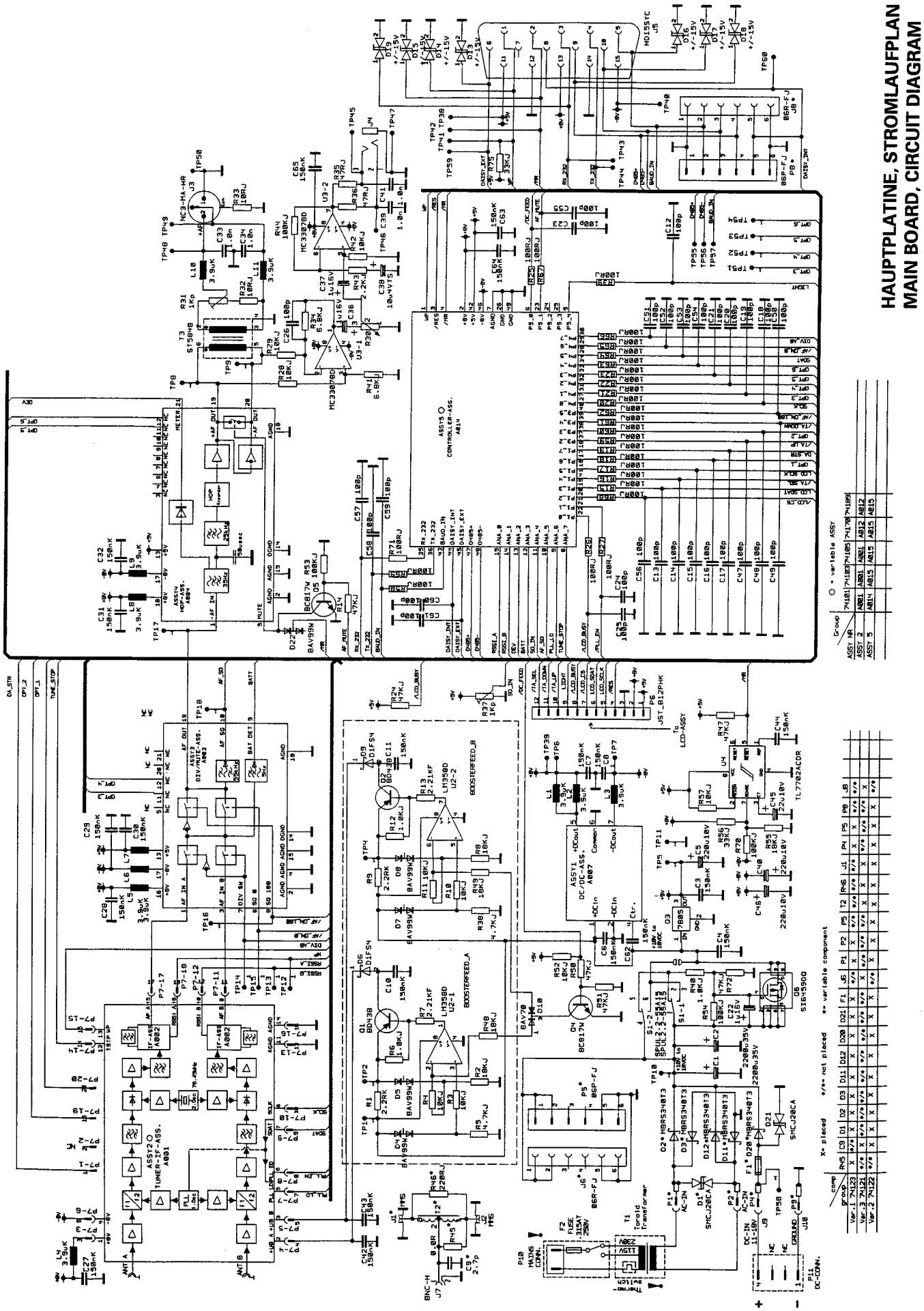
Dimensions: 208 x 190 mm

Connections, operating controls, displays

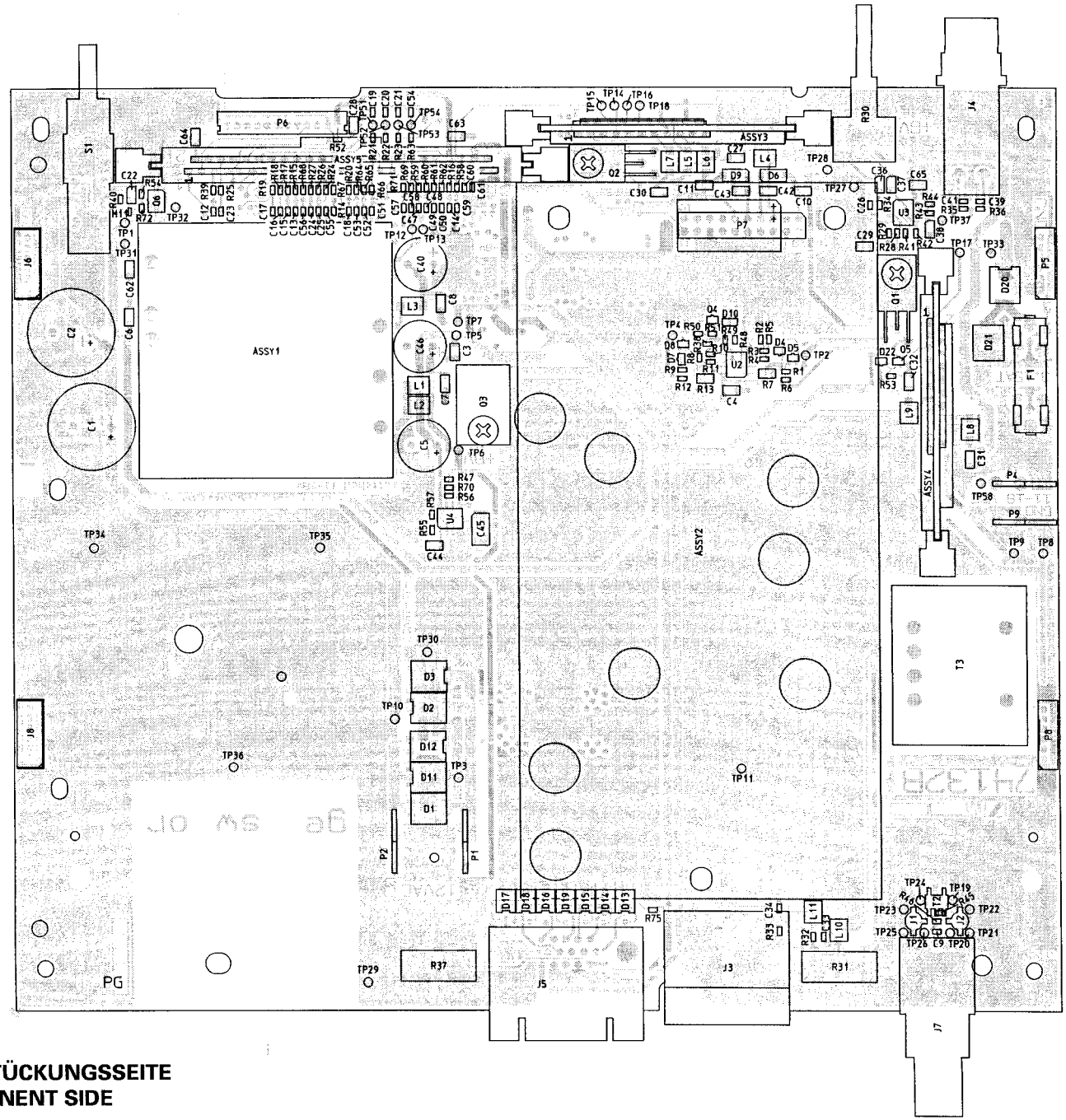
Front side
1. 1/4" (6.3 mm) Ø jack, unbal., AF output
2. Headphone volume control
3. Multi-function display panel
4. ON/OFF switch

Rear side
5. BNC, RF input
6. Control for AF output, XLR, balanced
7. Squelch control
8. 2-pin IEC mains connector with fuse
9. Service/programming socket
10. XLR output socket

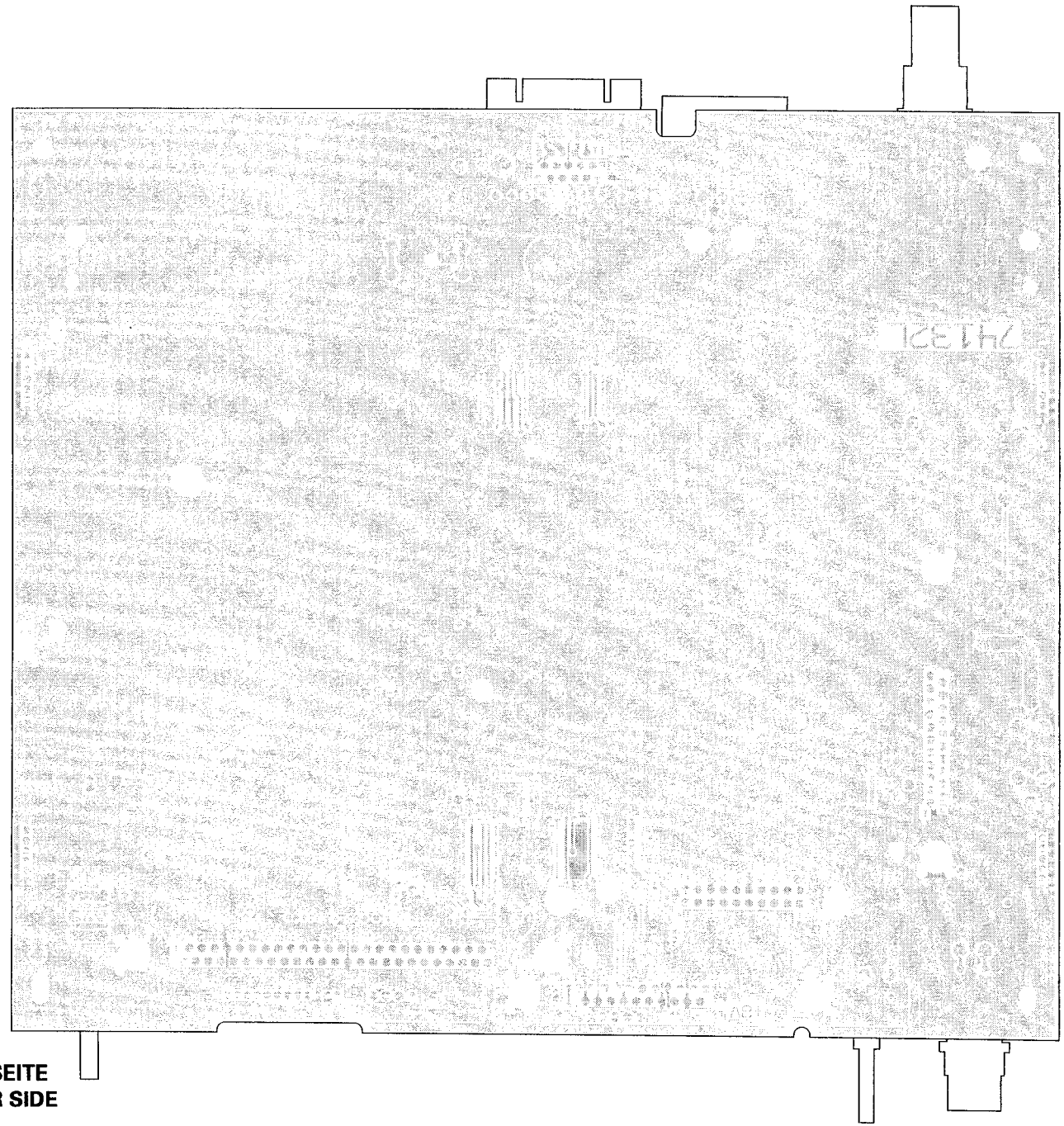
NOTES:



HAUPTPLATINE, STROMLAUFPLAN
MAIN BOARD, CIRCUIT DIAGRAM



HAUPTPLATINE, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
MAIN BOARD, PRINTED CIRCUIT BOARD, COMPONENT SIDE

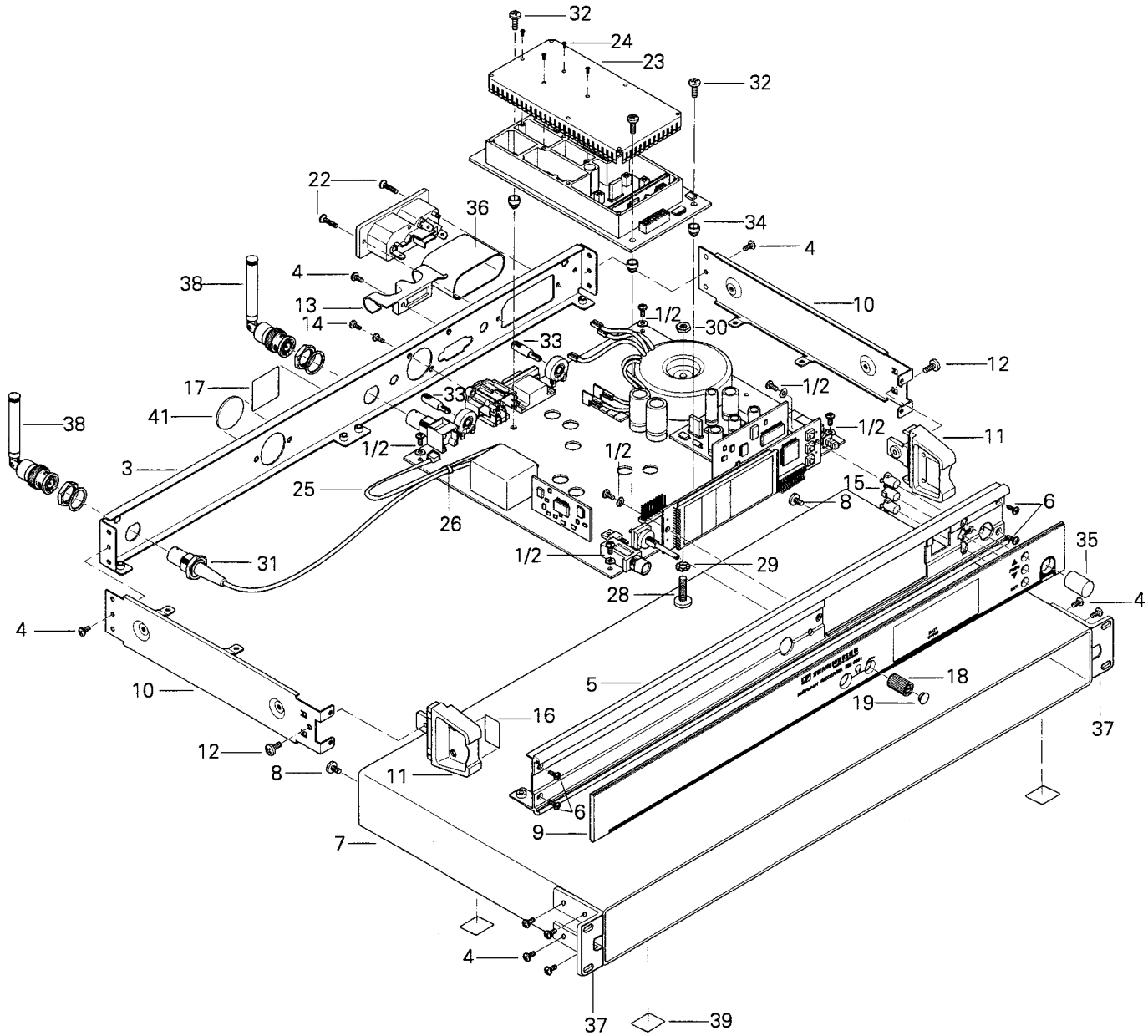


HAUPTPLATINE, GEDRUCKTE SCHALTUNG, LÖTSEITE
MAIN BOARD, PRINTED CIRCUIT BOARD, SOLDER SIDE

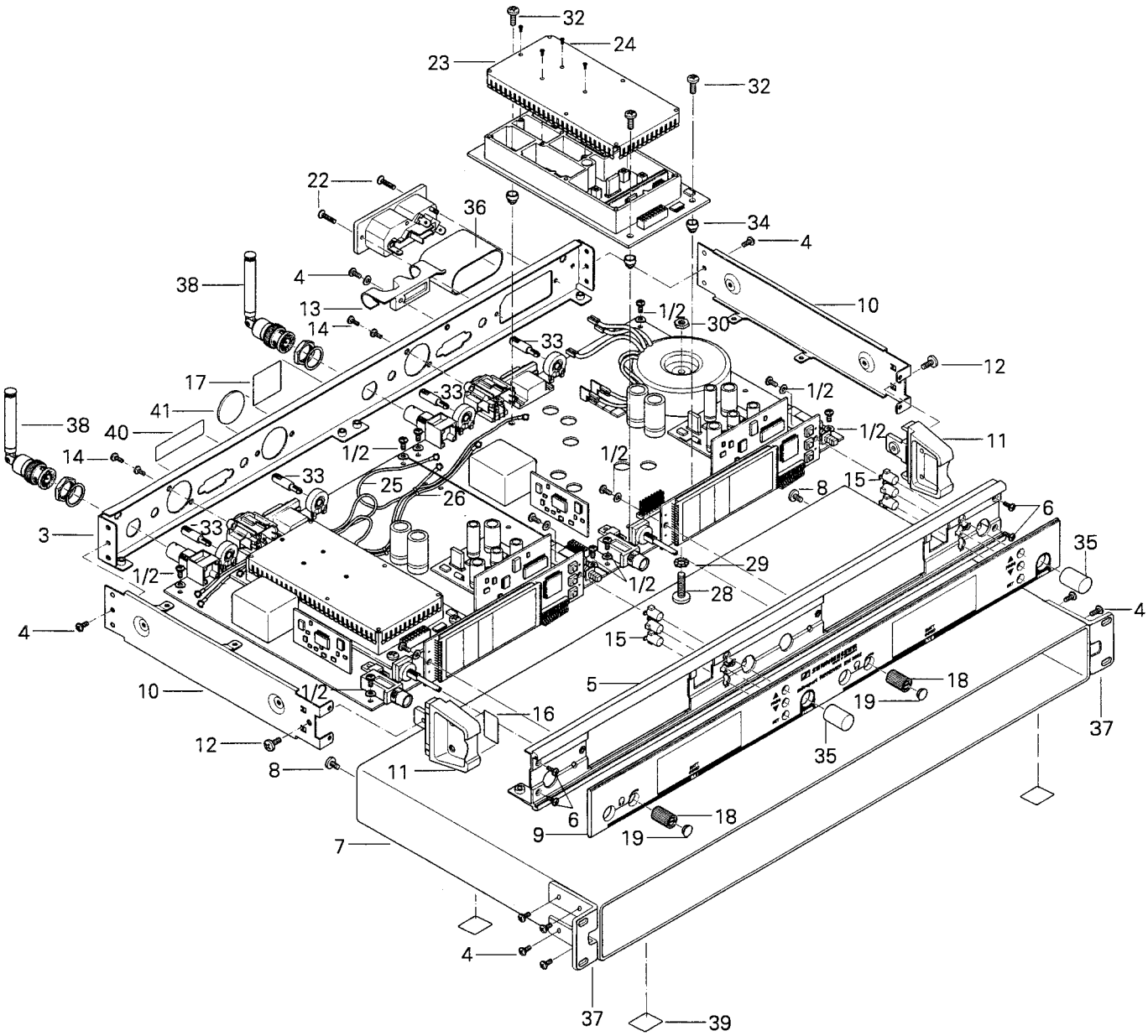
12 EXPLOSIONSZEICHNUNG

12 EXPLODED VIEW

EM 3031



EM 3032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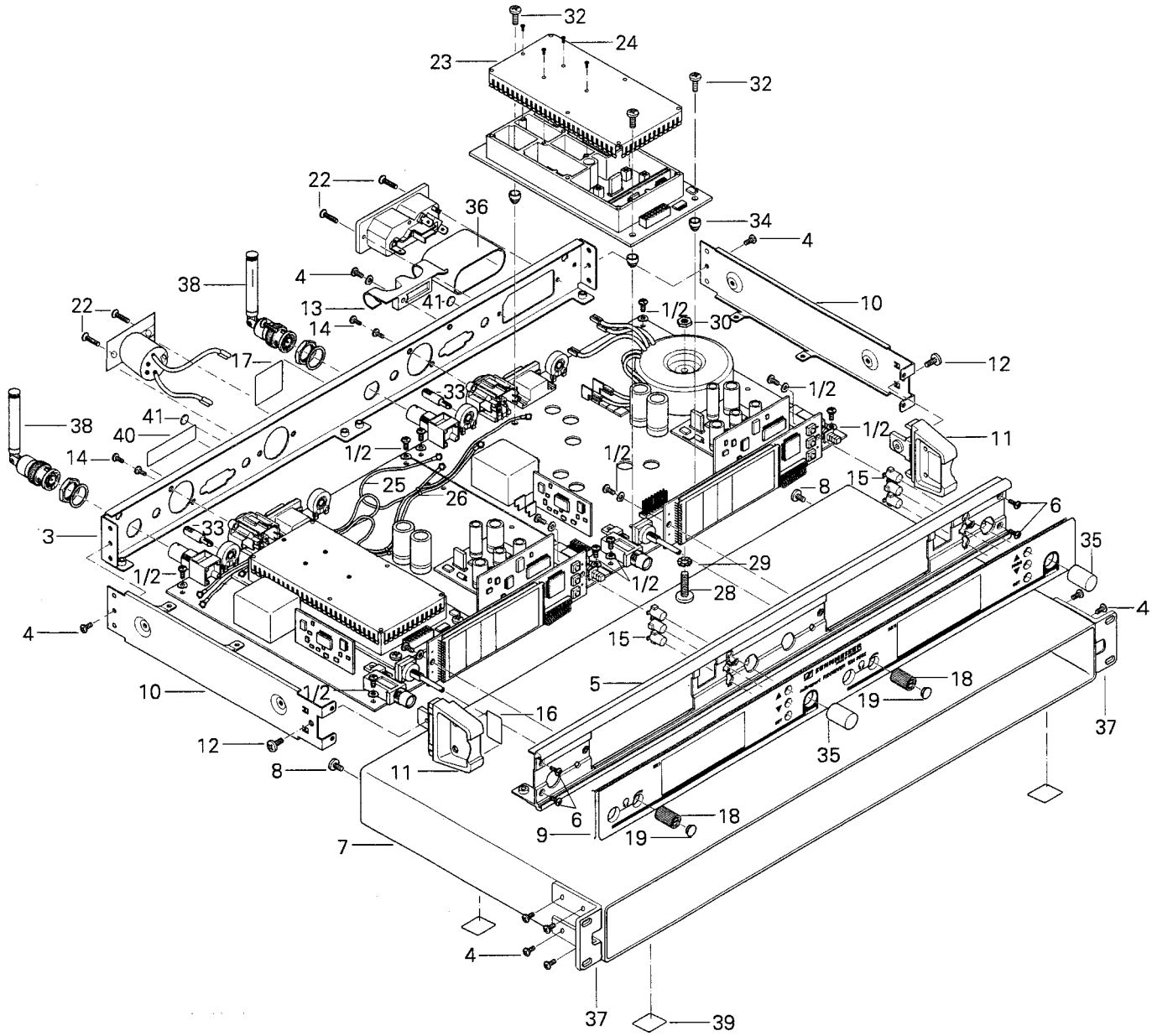
EM 3532-U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13 ERSATZTEILE

13 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
001	22996	Linsenschraube M3x6 ISO7045	Lens screw M3x6 ISO7045
002	22639	Federscheibe A3 DIN137	Spring washer A3 DIN137
003A	73759	Rückwand EM3031	Rear panel EM3031
003B	57556	Rückwand EM3032/EM3532	Rear panel EM3032/EM3532
004	53276	Linsenschraube CM3x6 DIN7500	Lens screw CM3x6 DIN7500
005	57530	Frontprofil	Front panel
006	58655	Senkschraube MM2,5x6 DIN7500	Countersunk screw MM2.5x6 DIN7500
007	57553	Gehäuse	Housing
008	23003	Linsenschraube M4x6 ISO7045	Lens screw M4x6 ISO7045
009A	74117	Blende EM3031	Cover EM3031
009B	74124	Blende EM3032	Cover EM3032
009C	58229	Blende EM3532	Cover EM3532
010	56907	Seitenblech	Sheet metal, side
011	57519	Griff	Handle
012	58656	Linsenschraube CM4x8 DIN7500	Lens screw CM4x8 DIN7500
013	51256	Zugentlastung	Strain relief
014	53282	Zylinderschraube KB30x6	Cheese head screw KB30x6
015	57570	Knopf RD6,0x10,0 schwarz	Knob RD6.0x10.0 black
016	47462	Schild 20x12,5 Aluminium	Label 20x12.5 aluminium
017	54786	Schild 33,9x32 Polyester	Label 33.9x32 polyester
018	75115	Knopf RD9,0x14,0 schwarz	Knob RD9.0x14.0 black
019	19803	Kappe mit Markierung schwarz	Cap with marking black
022	46595	Senkschraube MM3x12 DIN7500	Countersunk screw MM3x12 DIN7500
023	56947	Abschirmdeckel 120,2x57,6x8,5	Shielding cover 120.2x57.6x8.5
024	53279	Linsenschraube CM2x4 DIN7500	Lens screw CM2x4 DIN7500
025	45843	HF-Kabel 0,26m 50R	RF cable 0.26m 50R
026	57248	Kabelhalter	Cableholder
028	59055	Schraube sechskant M5x30 ISO4017	Screw hexagon M5x30 ISO4017
029	47500	Scheibe A5,3 DIN125	Washer A5.3 DIN125
030	26841	Mutter sechskant M5 ISO4035	Nut hexagon M5 ISO4035
031	59031	HF-Kabel mit BNC-Buchse 0,26m 50R	RF cable with BNC socket 0.26m 50R
032	27728	Blechschraube St3,9x9,5 ISO7049	Sheet metal screw St3.9x9.5 ISO7049
033	59054	Steckwelle RD6,0x22 rot	Shaft extension RD6.0x22 red
034	55974	Abstandshalter	Distance holder
035	57568	Knopf RD10,4x16,0 rot	Knob RD10.4x16.0 red
036	59095	Schrumpfschlauch RD38,1x42	Shrinking tube RD38.1x42
037	51265	Winkel mit Schrauben	Angle with screws
038A	54378	Teleskopantenne mit Gelenk 430-960MHz	Telescopic antenna with swivel mount 430-960MHz
038B	50200	Teleskopantenne mit Gelenk 138-250MHz	Telescopic antenna with swivel mount 138-250MHz
039	70506	Fuß	Foot
040	74128	Schild 60x14,5 Polyester	Label 60x14.5 polyester
041A	73782	Abdeckkappe, 20mmø	Covering cap, 20mmø
041B	73781	Abdeckkappe, 8mmø	Covering cap, 8mmø
042	72217	Kontaktbuchse 10-polig	Contact socket 10-pin
043	72218	Kontaktbuchse 11-polig	Contact socket 11-pin
044	72221	Kontaktbuchse 24-polig	Contact socket 24-pin
045	72222	Kontaktbuchse 25-polig	Contact socket 25-pin
046	21473	Sicherungshalter	Fuse holder
047	74159	Modulhalter	Bracket for modules
AA001	54324	Netzkabel 2,5m EU schwarz	Mains cable 2.5m EU black
AA002	54325	Netzkabel 2,5m US schwarz	Mains cable 2.5m US black
AA003	57256	Netzkabel 2,5m UK schwarz	Mains cable 2.5m UK black
AA004	75525	Kabel SUBD9/W auf SUBD15/M (PC>EM3532)	Cable SUBD9/F to SUBD15/M (PC>EM3532)
AA005	75528	Nachrüst-Set DC-Speisebuchse EM3032	Retrofit-kit DC power supply socket EM3032
ASSY1	58603	DC/DC Wandler 18V/+-8V A007	DC/DC converter 18V/+-8V A007
ASSY2A	70548	Tuner-Modul A001 (430-494MHz)	Tuner assembly A001 (430-494MHz)
ASSY2B	70549	Tuner-Modul A001 (470-598MHz)	Tuner assembly A001 (470-598MHz)
ASSY2C	70550	Tuner-Modul A001 (574-702MHz)	Tuner assembly A001 (574-702MHz)
ASSY2D	70551	Tuner-Modul A001 (678-824MHz)	Tuner assembly A001 (678-824MHz)
ASSY2E	70552	Tuner-Modul A001 (800-960MHz)	Tuner assembly A001 (800-960MHz)
ASSY2F	75533	Tuner-Modul A012 (138-155MHz)	Tuner assembly A012 (138-155MHz)
ASSY2G	75534	Tuner-Modul A012 (148-181MHz)	Tuner assembly A012 (148-181MHz)
ASSY2H	75535	Tuner-Modul A012 (174-223MHz)	Tuner assembly A012 (174-223MHz)
ASSY2I	75536	Tuner-Modul A012 (216-260MHz)	Tuner assembly A012 (216-260MHz)
ASSY3	74140	Schalt-Modul A003 (5Hz-20KHz)	Diversity assembly A003 (5Hz-20KHz)
ASSY4	73748	HDP-Modul A004 (40Hz-20KHz)	HDP assembly A004 (40Hz-20KHz)
ASSY5A	74141	Prozessor-Modul A015	Processor assembly A015
ASSY5B	74142	Prozessor-Modul A014, S-MCD	Processor assembly A014, S-MCD
ASSY6	58295	Anzeige-Modul A006	Display assembly A006
C001	72122	Kondensator AL-ELKO 2,2mF 35V GPF	Capacitor AL-ELKO 2.2mF 35V GPF
C002	72122	Kondensator AL-ELKO 2,2mF 35V GPF	Capacitor AL-ELKO 2.2mF 35V GPF

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C003	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C004	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C005	24149	Kondensator AL-ELKO 220uF 10V GPF	Capacitor AL-ELKO 220uF 10V GPF
C006	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C007	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C008	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C009	45167	SMD Kondensator KERKO 2,7pF 50V NPO	SMD capacitor KERKO 2.7pF 50V NPO
C010	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C011	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C012	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C013	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C014	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C015	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C016	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C017	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C018	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C019	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C020	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C021	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C022	41414	SMD Kondensator TA-KO 1uF 16V	SMD capacitor TA-KO 1uF 16V
C023	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C024	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C025	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C026	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C027	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C028	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C029	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C030	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C031	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C032	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C033	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C034	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C036	41414	SMD Kondensator TA-KO 1uF 16V	SMD capacitor TA-KO 1uF 16V
C037	41414	SMD Kondensator TA-KO 1uF 16V	SMD capacitor TA-KO 1uF 16V
C038	48318	SMD Kondensator TA-KO 10uF 4V	SMD capacitor TA-KO 10uF 4V
C039	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C040	24149	Kondensator AL-ELKO 220uF 10V GPF	Capacitor AL-ELKO 220uF 10V GPF
C041	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C042	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C043	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C044	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C045	41415	SMD Kondensator TA-KO 22uF 10V	SMD capacitor TA-KO 22uF 10V
C046	24149	Kondensator AL-ELKO 220uF 10V GPF	Capacitor AL-ELKO 220uF 10V GPF
C047	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C048	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C049	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C050	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C051	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C052	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C053	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C054	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C055	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C056	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C057	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C058	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C059	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C060	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C061	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C062	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C063	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C064	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C065	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
D001	45827	SMD Begrenzer-Diode SMCJ20CA DO214	SMD threshold diode SMCJ20CA DO214
D002	45665	SMD Schottky-Diode MBRS340T3	SMD Schottky diode MBRS340T3
D003	45665	SMD Schottky-Diode MBRS340T3	SMD Schottky diode MBRS340T3
D004	72215	SMD Doppeldiode BAV99W SOT323	SMD double diode BAV99W SOT323
D005	72215	SMD Doppeldiode BAV99W SOT323	SMD double diode BAV99W SOT323
D006	40350	SMD Schottky-Diode D1FS4 ROE	SMD Schottky diode D1FS4 ROE
D007	72215	SMD Doppeldiode BAV99W SOT323	SMD double diode BAV99W SOT323
D008	72215	SMD Doppeldiode BAV99W SOT323	SMD double diode BAV99W SOT323
D009	40350	SMD Schottky-Diode D1FS4 ROE	SMD Schottky diode D1FS4 ROE
D010	45253	SMD Doppeldiode BAV70 SOT23	SMD double diode BAV70 SOT23
D011	45665	SMD Schottky-Diode MBRS340T3	SMD Schottky diode MBRS340T3

POS	IDENT	BEZEICHNUNG	DESCRIPTION
D012	45665	SMD Schottky-Diode MBRS340T3	SMD Schottky diode MBRS340T3
D013	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D014	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D015	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D016	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D017	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D018	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D019	71387	SMD Supressor-Diode P6SMB15CAT3	SMD supressor diode P6SMB15CAT3
D020	45665	SMD Schottky-Diode MBRS340T3	SMD Schottky diode MBRS340T3
D021	45827	SMD Begrenzer-Diode SMCJ20CA DO214	SMD threshold diode SMCJ20CA DO214
D022	72215	SMD Doppeldiode BAV99W SOT323	SMD double diode BAV99W SOT323
F001	43219	Feinsicherung 3.15AT DIN41662	Fuse 3.15AT DIN41662
F002	25061	Feinsicherung 315mAT DIN41662	Fuse 315mAT DIN41662
J001	45811	SMD Buchse 50R	SMD socket 50R
J002	45811	SMD Buchse 50R	SMD socket 50R
J003	45819	Stecker, XLR3M	Connector, XLR3M
J004	45695	Klinkenbuchse 6,3mm	Jack socket 6,3mm
J005	45818	Federleiste	Spring strip
J006	45820	Federleiste	Spring strip
J007	45706	Buchse BNC 50R	Socket BNC 50R
J008	45820	Federleiste	Spring strip
J009	74191	Kabel 150mm rot	Cable 150mm red
J010	74192	Kabel 150mm blau	Cable 150mm blue
L001	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L002	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L003	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L004	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L005	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L006	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L007	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L008	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L009	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L010	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L011	45563	SMD Spule 3,9uH	SMD coil 3.9uH
P001	45826	Flachstecker	Flat connector
P002	45826	Flachstecker	Flat connector
P004	45826	Flachstecker	Flat connector
P005	45821	Steckverbinder, flexibel	Connector, variable
P006	45792	Steckerleiste	Contact strip
P007	72208	Steckerleiste	Contact strip
P008	45821	Steckverbinder, flexibel	Connector, variable
P009	45826	Flachstecker	Flat connector
P010	45822	Kaltgerätestecker	Mains plug in socket
P011	50767	Einbaustecker D-XLR4-M Neutrik NC.4.MP	Socket D-XLR4-M Neutrik NC.4.MP
Q001	59099	SMD Transistor BD438 TO126	SMD Transistor BD438 TO126
Q002	59099	SMD Transistor BD438 TO126	SMD Transistor BD438 TO126
Q003	58043	IC 7805 TO220	IC 7805 TO220
Q004	45815	SMD Transistor BC817W SOT323	SMD transistor BC817W SOT323
Q005	45815	SMD Transistor BC817W SOT323	SMD transistor BC817W SOT323
Q006	72262	SMD Transistor SI6459DQ TSSOP	SMD transistor SI6459DQ TSSOP
R001	45202	SMD Widerstand 2R2 5% 0603	SMD resistor 2R2 5% 0603
R002	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R003	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R004	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R005	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R006	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R007	40343	SMD Widerstand MELF 2k21 1% 0204	SMD resistor MELF 2k21 1% 0204
R008	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R009	45202	SMD Widerstand 2R2 5% 0603	SMD resistor 2R2 5% 0603
R010	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R011	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R012	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R013	40343	SMD Widerstand MELF 2k21 1% 0204	SMD resistor MELF 2k21 1% 0204
R014	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R015	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R016	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R017	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R018	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R019	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R020	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R021	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R022	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R023	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R024	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R025	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R026	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R027	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R028	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R029	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R030	28896	Potentiometer 47k	Potentiometer 47k
R031	19757	Potentiometer 1k	Potentiometer 1k
R032	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R033	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R034	45137	SMD Widerstand 6k8 5% 0603	SMD resistor 6k8 5% 0603
R035	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R036	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R037	19757	Potentiometer 1k	Potentiometer 1k
R038	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R039	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R040	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R041	45137	SMD Widerstand 6k8 5% 0603	SMD resistor 6k8 5% 0603
R042	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R043	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R044	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R045	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R046	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R047	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R048	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R049	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R050	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R051	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R052	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R053	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R054	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R055	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R056	45141	SMD Widerstand 33k 5% 0603	SMD resistor 33k 5% 0603
R057	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R058	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R059	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R060	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R061	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R062	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R063	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R064	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R065	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R066	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R067	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R068	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R069	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R070	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R071	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R072	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R075	45141	SMD Widerstand 33k 5% 0603	SMD resistor 33k 5% 0603
S001	45888	Druckschalter	Press switch
T001	45839	Transformator, Ringkern	Ring transformer
T002	45542	SMD Transformator 10MHz/1GHz	SMD transformator 10MHz/1GHz
T003	40590	Transformator, NF 1:1 Sym/Sym	Transformer, AF 1:1 Sym/Sym
U002	29114	SMD IC 358 S08	SMD IC 358 S08
U003	41277	SMD IC MC33078D SO8	SMD IC MC33078D SO8
U004	45795	SMD IC TL7702ACDR SO8	SMD IC TL7702ACDR SO8
ZZ010	58820	Faltschachtel EM3031	Folding box EM3031
ZZ012	57382	Schaumzuschnitt (Gehäuse) 382x570x2	Foam insert (housing) 382x570x2
ZZ013	58821	Schaumzuschnitt 520x310x40	Foam insert 520x310x40
ZZ014	34268	Haftetikett SE	Label SE
ZZ020A	68745	Bedienungsanleitung EM3031/3032	Instructions for use EM3031/3032
ZZ020B	68746	Bedienungsanleitung EM3532	Instructions for use EM3532
ZZ021	18300	Antragskarte "BAPT"	Order card "BAPT"

14 UHF TUNER-MODUL A001

14.1 ALLGEMEINES

Das Modul wird auf einer Leiterplatte von 140 x 70 mm realisiert. Zur Abschirmung des Moduls wird ein Rahmen mit Deckel verwendet. Die Verbindung zur Grundplatine geschieht über Steckverbinder. Über zwei 50 Ohm-SMD-Buchsen wird die Verbindung zu den Antennenbuchsen hergestellt. Das Tuner-Modul wird mit der Grundplatine verschraubt.

14.2 SCHALTUNGSBESCHREIBUNG

Das Tuner-Modul enthält zwei gleiche HF-Teile für den Antenneneingang A und B und zwei gemeinsame Oszillatoren zur Umsetzung auf die 1. Zwischenfrequenz von 65,750 MHz und auf die zweite Zwischenfrequenz von 10,7 MHz.
Über die Antennenbuchse J1 wird die Empfangsspannung über den Eingangskreis L1 und C4 auf die Basis des HF - Verstärkers Q1 gegeben. Dieser verstärkt das Eingangssignal um 10 dB. Dem Transistor folgt das Zwischenkreisbandfilter L3, L4, C8 - C15. Über den Symmetriertrafo TR1 gelangt das HF-Signal auf den ersten Mischer U1. Mit Hilfe des 1. Oszillators wird hier die 1. Zwischenfrequenz von 65,750 MHz gebildet. Diese wird symmetrisch mit den Transistoren Q2 und Q3 verstärkt und auf das OFW - Filter Y1 gegeben. Das Spulenfilter T1, C31, C32 verbessert die Spiegelselektion und die Weitabselektion des OFW - Filters Y1.
Der zweite Mischer ist ein Diodenmischer D1. Die Bauelemente L11, L12, C44 und C45 trennen die zweite Zwischenfrequenz von 10,7 MHz von den anderen Frequenzanteilen. Mit dem Transistor Q5 wird die ZF-Spannung verstärkt und über das Filter Y4 ausgekoppelt und steht für das ZF-Modul zur Verfügung.

14.3 OSZILLATORFREQUENZEN

Der 1. Oszillator Q204 schwingt um 65,750 MHz unterhalb der Empfangsfrequenz. Der Buffer Q206 sorgt für eine Entkopplung zwischen Oszillator und Mischer U1 und U101. Vom Bufferausgang wird der Frequenzteiler 1 : 128/129 über das RC-Glied R233 und C233 angesteuert. Die PLL - Schaltung U201 wird von einer externen Prozessorschaltung gesteuert. Der 4 MHz Quarzoszillator besteht aus der Transistorstufe Q208. Das passive Loopfilter steuert die Nachstimmdioden D200 und D201 des freilaufenden Oszillators Q204.

Der zweite Mischoszillator ist ein Quarzoszillator und schwingt auf 76,450 (55,050) MHz. Er arbeitet auf die Buffer Q4 und Q104 der beiden Empfängerzüge. Der Bufferausgang Q4 versorgt die Mischdiode D1 mit Oszillatorspannung zum Mischen auf die zweite ZF von 10,7 MHz.

Die Betriebsspannung des Tuner-Moduls beträgt 8 VDC. Die benötigten 5 VDC für die PLL-Schaltung und den Frequenzteiler werden mit dem Spannungsregler U204 erzeugt.

NOTIZEN:

14 UHF TUNER ASSEMBLY A001

14.1 GENERAL

The assembly is implemented on a PCB of 140 x 70 mm. For shielding the assembly, a frame with a lid is used which is connected to the main PCB via edge connectors. Two 50 Ω SMD sockets provide the connection to the antenna sockets. The tuner assembly is screwed to the main PCB.

14.2 DESCRIPTION

The tuner assembly contains two identical RF sections for antenna inputs A and B and two common oscillators for generating the 1st intermediate frequency of 65.750 MHz and the 2nd intermediate frequency of 10.7 MHz.
Via antenna socket J1, the receiver voltage is fed - via the input circuit L1 and C3 - to the base of RF amplifier Q1. Here, the input signal is amplified by 10 dB. The transistor is followed by the IF band pass filter L3, L4, C8 - C15. Via the balancing transformer TR1, the RF signal is passed to the first mixer U1. Here, the 1st intermediate frequency of 85.750 MHz is generated by the 1st oscillator. The 1st intermediate frequency is electronically balanced and amplified by transistors Q2 and Q3 and fed to the SAW filter Y1. Filter T1, C31, C32 improves the image rejection and the far-off selectivity of the SAW filter Y1.

The 2nd mixer is diode mixer D1. Components L11, L12, C44 and C45 separate the 2nd intermediate frequency of 10.7 MHz from other frequency components. The IF voltage is amplified by transistor Q5, decoupled via filter Y2, and is available for the IF assembly.

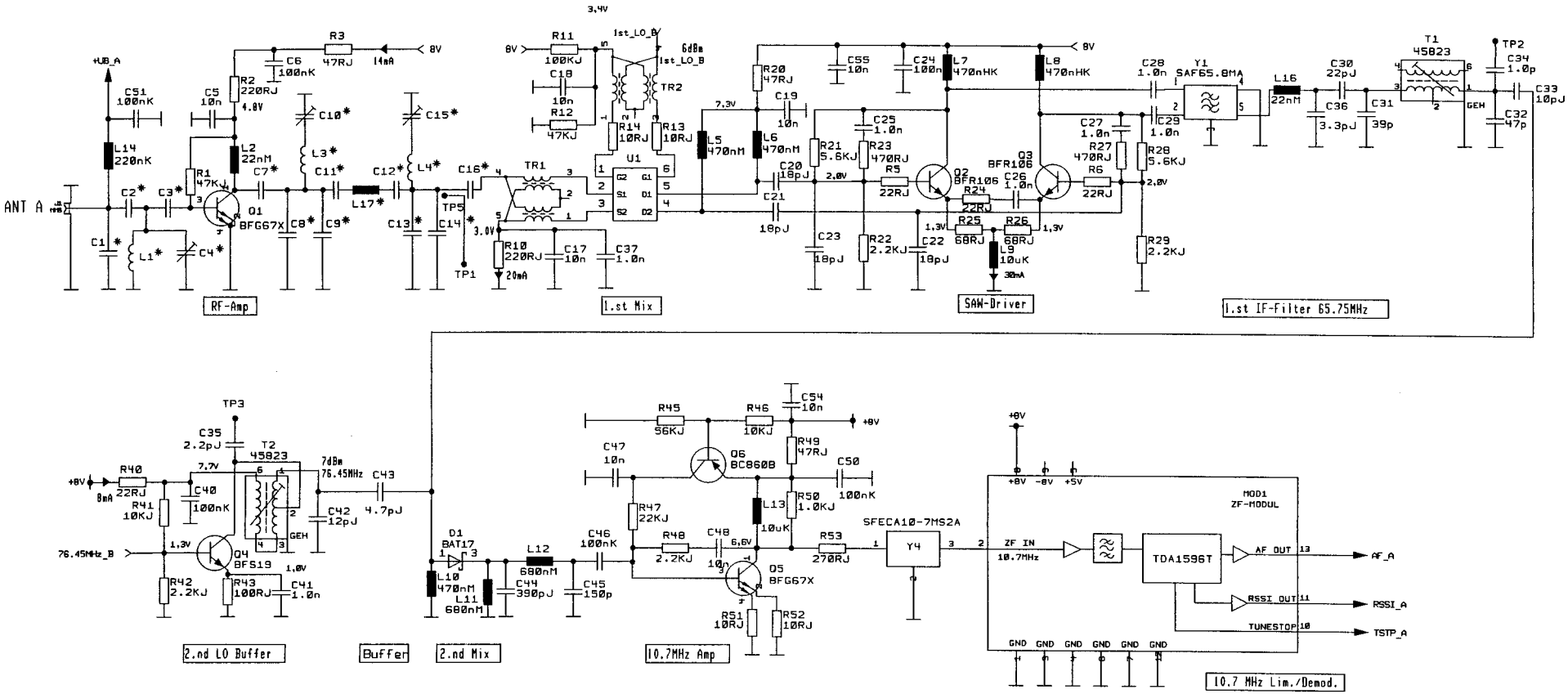
14.3 OSCILLATOR FREQUENCIES

The 1st oscillator Q204 oscillates at 65,750 MHz below the receiving frequency. Buffer Q206 decouples the oscillator from the mixers U1 and U101. From the buffer output, prescaler 1 : 128/129 is addressed via the RC circuit R233 and C233. The PLL circuit U201 is controlled by an external processor circuit. The 4 MHz crystal oscillator consists of the transistor stage Q208. The passive loop filter controls the frequency trimming diodes D200 and D201 of the free-running oscillator Q204.

The 2nd mixing oscillator is a crystal oscillator which oscillates at 76.450 (55.050) MHz. It connects to the buffers Q4 and Q104 of the two receiver sections. Buffer output Q4 supplies the diode mixer D1 with the oscillator voltage needed for generating the 2nd intermediate frequency of 10.7 MHz.

The operating voltage of the tuner assembly is 8 VDC. The 5 VDC required for the PLL circuit and the prescaler are produced with the voltage regulator U204.

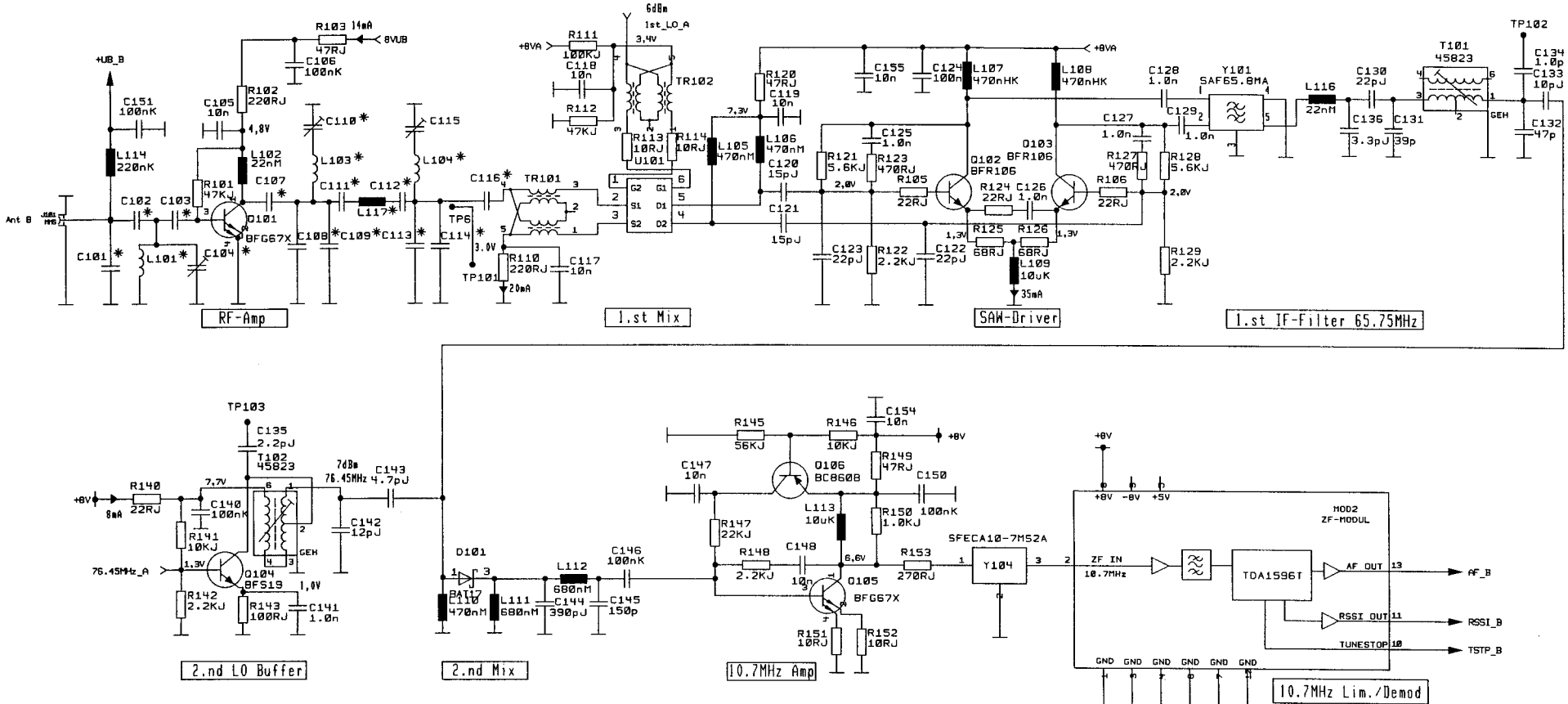
NOTES:



* Components of Range

Range		RF-Amplifier																	Code-Resistors				
No.	Freq. MHz	C1	C2	L1	C3	C4	C7	C8	C9	L3	C10	C11	C12	L4	C13	C14	C15	C16	L17	R501	R502	R503	R504	R505
1	430-494	–	2p7	5n0	2p7	3/10p	3p3	–	3p9	18n5	3/10p	3p3	3p3	18n5	3p9	–	3/10p	3p9	82n	1K	–	–	–	–
2	470-598	–	2p7	2n5	2p7	3/10p	3p3	–	3p3	18n5	3/10p	1p0	1p5	18n5	3p9	–	3/10p	3p9	82n	–	1K	–	–	–
3	574-702	–	2p2	2n5	3p3	3/10p	1p5	1p5	1p5	12n5	3/10p	1p0	1p5	12n5	2p7	2p7	3/10p	1p5	82n	–	–	1K	–	–
4	678-824	–	1p5	2n5	2p2	3/10p	1p5	1p0	1p5	12n5	2/6p	1p5	1p5	12n5	1p5	1p5	2/6p	1p5	82n	–	–	–	1K	–
5	800-960	–	1p0	2n5	1p5	2/6p	1p0	–	2.7p	8n0	2/6p	1p0	1p0	8n0	2p2	1p2	2/6p	1p8	47n	–	–	–	–	1K

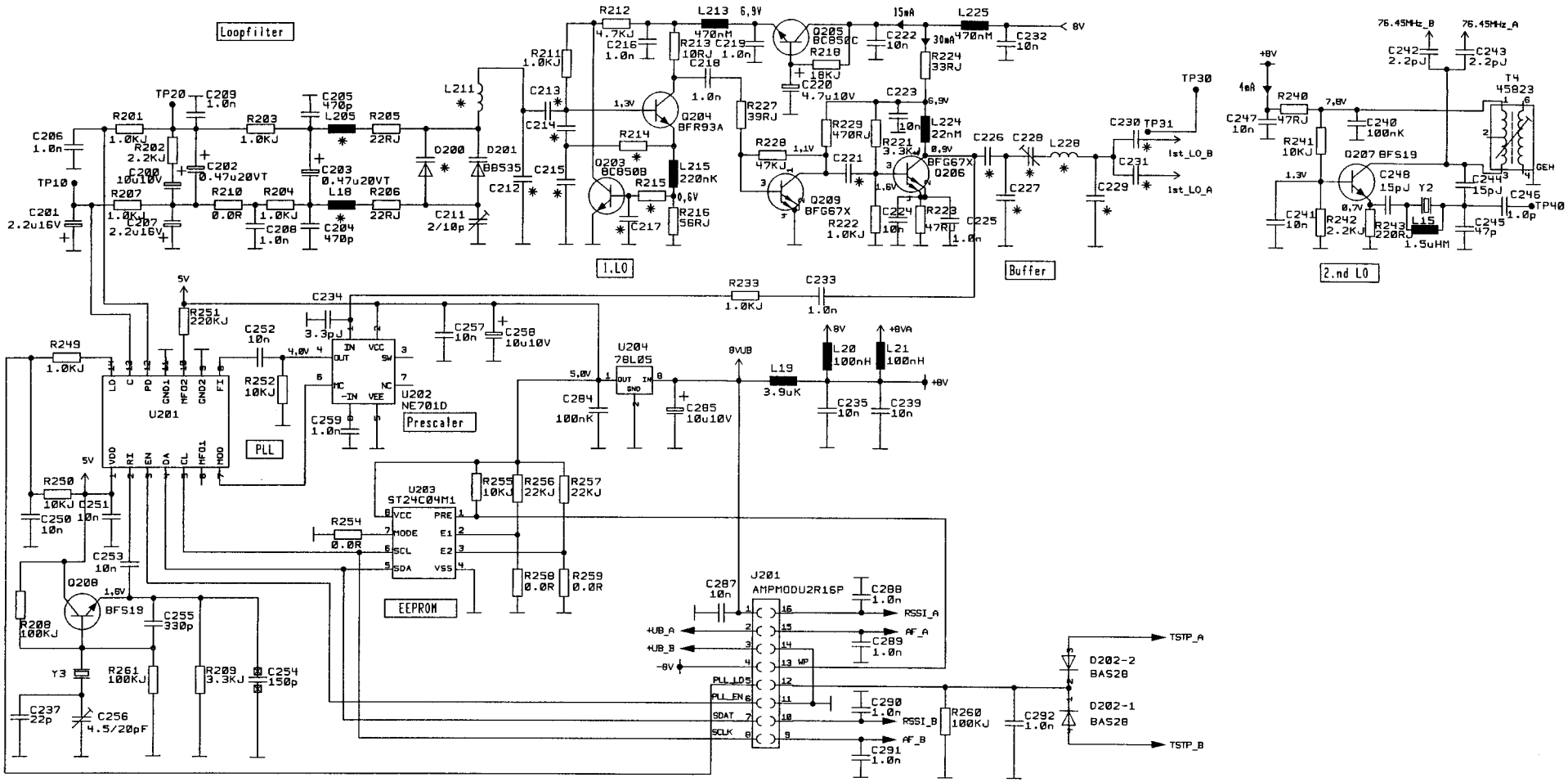
UHF TUNER-MODUL A001, A-KANAL, STROMLAUFPLAN
UHF TUNER ASSEMBLY A001, A CHANNEL, CIRCUIT DIAGRAM



* Components of Range

Range		RF-Amplifier																		Code-Resistors				
No.	Freq. MHz	C101	C102	L101	C103	C104	C107	C108	C109	L103	C110	C111	C112	L104	C113	C114	C115	C116	L117	R501	R502	R503	R504	R505
1	430-494	–	2p7	5n0	2p7	3/10p	3p3	–	3p9	18n5	3/10p	3p3	3p3	18n5	3p9	–	3/10p	3p9	82n	1K	–	–	–	–
2	470-598	–	2p7	2n5	2p7	3/10p	3p3	–	3p9	18n5	3/10p	1p0	1p5	18n5	3p9	–	3/10p	3p9	82n	–	1K	–	–	–
3	574-702	–	2p2	2n5	3p3	3/10p	1p5	1p5	1p5	12n5	3/10p	1p0	1p5	12n5	2p7	2p7	3/10p	1p5	82n	–	–	1K	–	–
4	678-824	–	1p5	2n5	2p2	2/6p	1p5	1p0	1p5	12n5	2/6p	1p5	1p5	12n5	1p5	1p5	2/6p	1p5	82n	–	–	–	1K	–
5	800-960	–	1p0	0.0R	1p5	2/6p	1p0	–	2.7p	8n0	2/6p	1p0	1p0	8n0	2p2	1p2	2/6p	1p8	47n	–	–	–	–	1K

UHF TUNER-MODUL A001, B-KANAL, STROMLAUFPLAN
UHF TUNER ASSEMBLY A001, B CHANNEL, CIRCUIT DIAGRAM

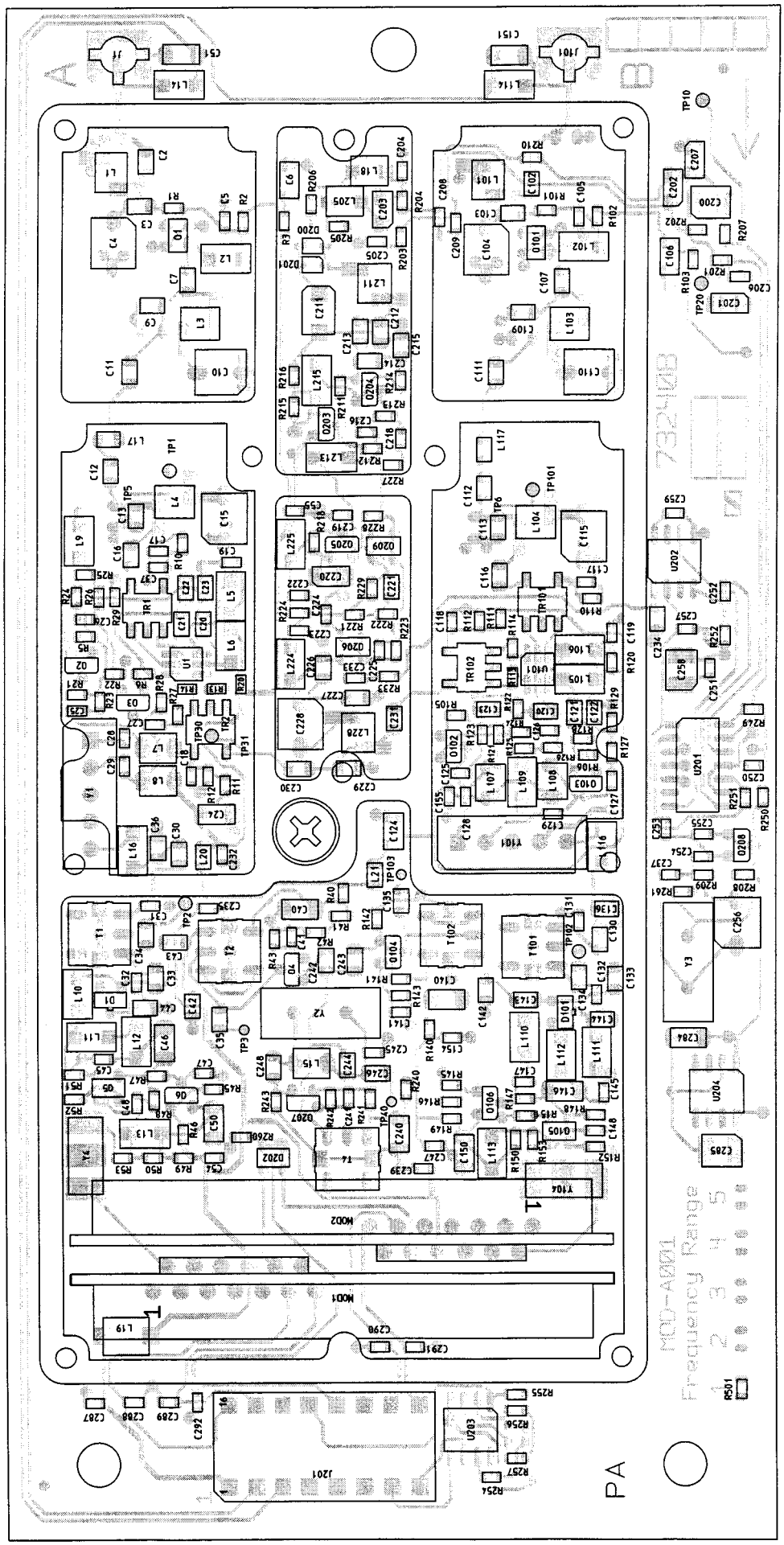


* Components of Range

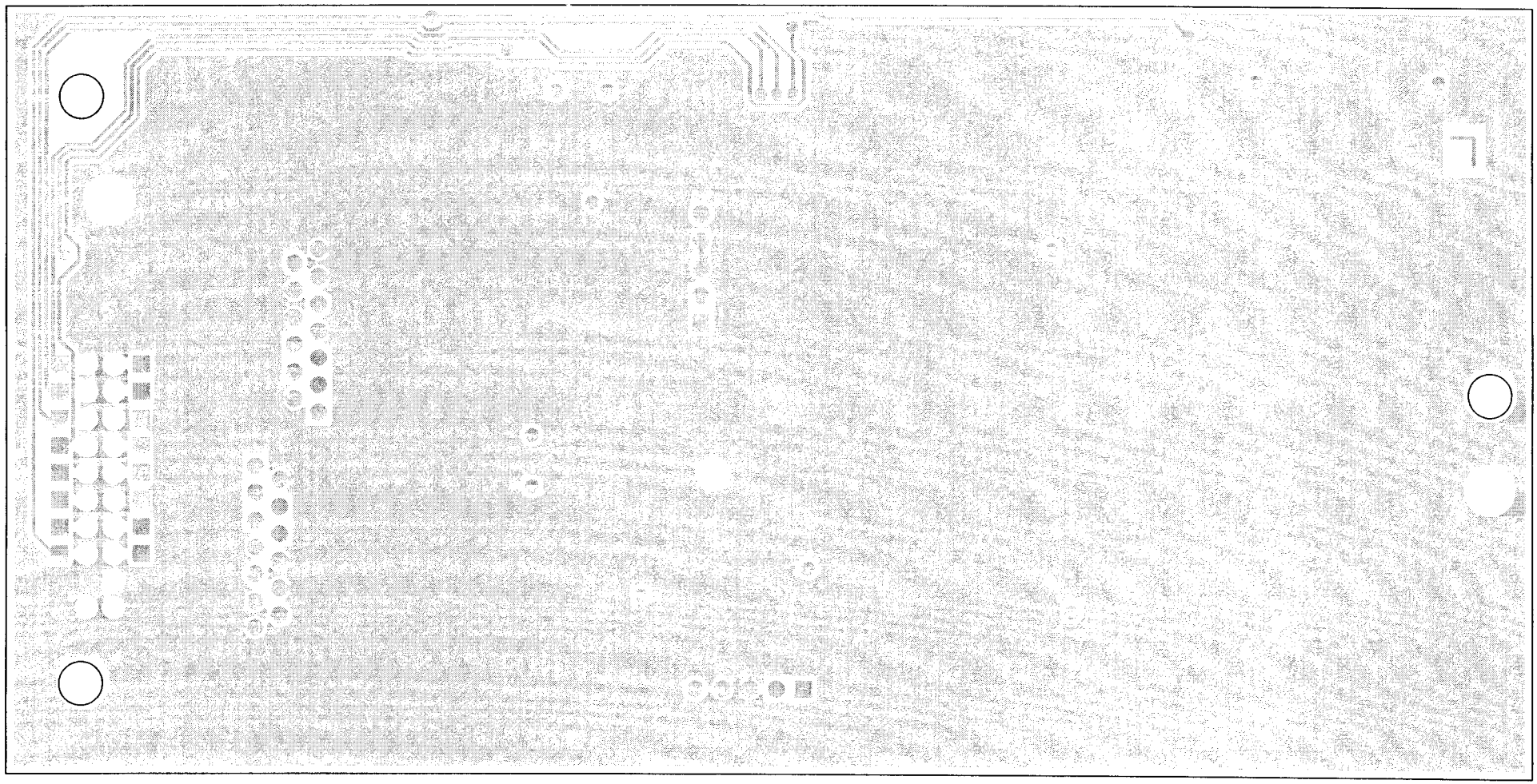
Range		VCO												BUFFER								EE-PROM	
No.	Freq. MHz	L205	L18	L211	C211	C212	C213	C214	C215	C217	R214	R215	D200	C221	C226	C227	L228	C228	C229	C230	C231	R258	R259
1	430-494	46559	46559	18n5	5p20	10p	4p7	6p8	3p9	-	10R	2K2	BB535	4p7	3p3	10p	12n5	4.5-20	10p	6p8	6p8	--	--
2	470-598	46559	46559	18n5	1.8p10	10p	4p7	6p8	3p9	-	10R	2K2	BB535	4p7	3p3	10p	12n5	4.5-20	10p	6p8	6p8	--	--
3	574-702	46559	46559	18n5	1.8p10	4p7	3p9	6p8	3p3	-	10R	2K2	--	4p7	2p7	8p2	12n5	3/10p	8p2	5p6	5p6	--	--
4	680-824	46559	46559	12n5	1.8p10	4p7	3p3	4p7	1p8	-	10R	1K0	--	4p7	3p3	8p2	8n0	3/10p	10p	4p7	8p2	--	--
5	800-960	45681	45681	8n0	1.8p10	2p7	2p7	4p7	1p5	-	4R7	1K0	--	4p7	2p2	6p8	8n0	2/6p	5p6	2p7	2p7	--	--

R501 1.0KJ
R502 1.0KJ
R503 1.0KJ
R504 1.0KJ
R505 1.0KJ

UHF TUNER-MODUL A001, OSZILLATOR, STROMLAUFPLAN
UHF TUNER ASSEMBLY A001, OSCILLATOR, CIRCUIT DIAGRAM



UHF TUNER-MODUL A001, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
UHF TUNER ASSEMBLY A001, PRINTED CIRCUIT BOARD, COMPONENT SIDE



UHF TUNER-MODUL A001, GEDRUCKTE SCHALTUNG, LÖTSEITE
UHF TUNER ASSEMBLY A001, PRINTED CIRCUIT BOARD, SOLDER SIDE

PIN No.	Signal	in out	Level	Ri
1	+ 8V	in		
2	+ 12 - 18V max. 100 min. 60 mA	out		
3	+ 12 - 18V max. 100 min. 60 mA	out		
4	- 8V	NC		
5	PLL-LD	out		
6	PLL-EN	in		
7	SDAT	in out		
8	SCLK	in		
9	AF out B	out	6 dBu max	≤200R
10	RSSI B	out	≤0,5...+5V	≤6k
11	GND ⏚	in		
12	TSTP	out	hi +5V low 0V	≤6k
13	WP	in		
14	GND ⏚	in		
15	AF out A	out	6 dBu max.	≤200R
16	RSSI A	out	≤0,5...+5V	≤6k

UHF TUNER-MODUL A001 PINBELEGUNG
UHF TUNER ASSEMBLY A001, PIN ASSIGNMENTS

characteristics	datas
Dimensions	143x72x20mm
Weight	178g
Connector between tuner assembly and main PCB	16-pin connectors pin spacing: 2x2,54mm and 2,54mm
Antenna inputs	2MMS-jack
Antenna input impedance	50Ω
Frequency range	430-960MHz
Receiver frequencies	max. 32 in 4 groups
Switching bandwith	24 MHz
Frequency stability	±10ppm (-10°C to 55°C)
1st local oscillator	Lo= fr - 65,75 MHz
2nd local oscillator	76,45 MHz
Input limiting-3dB	≤ 1µV
Sensitivity S/N-26dB (A) (at nominal deviation)	≤ 1µV
Max.sensitivity (at peak deviation)	≥ 76dB (A)
RSSI voltage	≤ 0,5-4V
Image rejection	≥ 50dB, typ. 65dB
AM rejection 60% AM	≥ 46dB
Adjacent channel rejection	≥ 75dB
Intermodulation attenuation	≥ 66dB
Free field interference radiation 30-2000MHz	≥ -57dBm (2nW)
Modulation	wideband FM
Nominal / peak deviation	±40kHz / ±56kHz
timeconstant	50 µs
AF-frequency response	45Hz-20kHz
AF-output at nominal deviation	0,775V
THD at 1kHz and nominal deviation	≤ 0,5%
Temperature range	-10°C - +55°C
Power supply	8V DC
Current consumption	280 mA

UHF TUNER-MODUL A001, TECHNISCHE DATEN
UHF TUNER ASSEMBLY A001, TECHNICAL DATA

14.8 ERSATZTEILE

14.8 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	70548	**Tuner-Modul A001 (430-494MHz)**	**Tuner assembly A001 (430-494MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C002	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C003	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C004	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C005	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C009	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C010	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C011	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C012	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C013	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C015	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C016	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C017	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C018	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C019	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C020	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C021	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C022	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C023	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C024	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C025	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C026	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C027	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C028	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C029	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C030	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C031	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C032	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C033	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C034	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C035	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C036	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C037	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C040	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C041	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C042	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C043	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C044	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C045	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C046	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C047	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C048	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C050	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C051	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C054	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C055	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C102	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C103	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C104	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C105	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C109	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C110	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C111	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C112	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C113	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C115	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C116	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C117	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C118	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C119	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C120	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C121	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C123	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C124	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C125	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C126	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C127	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C128	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C129	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C130	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C131	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C132	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C133	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C134	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C135	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C136	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C140	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C141	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C142	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C143	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C144	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C145	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C146	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C147	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C148	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C150	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C151	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C154	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C155	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C205	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45875	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C212	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C213	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C214	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C215	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C216	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C227	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C228	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C229	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C230	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C231	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C232	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C235	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C240	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C241	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C242	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C243	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C244	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C245	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C246	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C247	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C248	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D001	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D101	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D200	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	45865	SMD Luftspule 5nH	SMD air core coil 5nH
L002	45704	SMD Spule 22nH	SMD coil 22nH
L003	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L004	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L005	45681	SMD Spule 470nH	SMD coil 470nH
L006	45681	SMD Spule 470nH	SMD coil 470nH
L007	46559	SMD Spule 470nH	SMD coil 470nH
L008	46559	SMD Spule 470nH	SMD coil 470nH
L009	45683	SMD Spule 10uH	SMD coil 10uH
L010	45681	SMD Spule 470nH	SMD coil 470nH
L011	45682	SMD Spule 680nH	SMD coil 680nH
L012	45682	SMD Spule 680nH	SMD coil 680nH
L013	45683	SMD Spule 10uH	SMD coil 10uH
L014	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L015	34676	SMD Spule 1,5uH	SMD coil 1.5uH
L016	45704	SMD Spule 22nH	SMD coil 22nH
L017	45391	SMD Spule 82nH	SMD coil 82nH
L018	46559	SMD Spule 470nH	SMD coil 470nH
L019	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L020	45392	SMD Spule 100nH	SMD coil 100nH
L021	45392	SMD Spule 100nH	SMD coil 100nH
L101	45865	SMD Luftspule 5nH	SMD air core coil 5nH
L102	45704	SMD Spule 22nH	SMD coil 22nH
L103	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L104	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L105	45681	SMD Spule 470nH	SMD coil 470nH
L106	45681	SMD Spule 470nH	SMD coil 470nH
L107	46559	SMD Spule 470nH	SMD coil 470nH
L108	46559	SMD Spule 470nH	SMD coil 470nH
L109	45683	SMD Spule 10uH	SMD coil 10uH
L110	45681	SMD Spule 470nH	SMD coil 470nH
L111	45682	SMD Spule 680nH	SMD coil 680nH
L112	45682	SMD Spule 680nH	SMD coil 680nH
L113	45683	SMD Spule 10uH	SMD coil 10uH
L114	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L116	45704	SMD Spule 22nH	SMD coil 22nH
L117	45391	SMD Spule 82nH	SMD coil 82nH
L205	46559	SMD Spule 470nH	SMD coil 470nH
L211	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L213	45681	SMD Spule 470nH	SMD coil 470nH
L215	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L224	45704	SMD Spule 22nH	SMD coil 22nH
L225	45681	SMD Spule 470nH	SMD coil 470nH
L228	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
Q001	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q002	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q003	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q004	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q005	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143

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Q006	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q101	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q102	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q103	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q104	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q105	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q106	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q207	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R002	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R003	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R005	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R006	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R010	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R011	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R012	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R013	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R014	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R020	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R021	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R022	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R023	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R024	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R025	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R026	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R027	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R028	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R029	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R040	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R041	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R042	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R043	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R045	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R046	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R047	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R048	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R049	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R050	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R051	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R052	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R053	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R101	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R102	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R103	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R105	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R106	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R110	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R111	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R112	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R113	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R114	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R120	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R121	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R122	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R123	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R124	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R125	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R126	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R127	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R128	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R129	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R140	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R141	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R142	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R143	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R145	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R146	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R147	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R148	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R149	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R150	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R151	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R152	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R153	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R200	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R206	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R210	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R214	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R218	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R240	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R241	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R242	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R243	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R501	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
T001	45823	SMD HF Spule	SMD RF coil
T002	45823	SMD HF Spule	SMD RF coil
T004	45823	SMD HF Spule	SMD RF coil
T101	45823	SMD HF Spule	SMD RF coil
T102	45823	SMD HF Spule	SMD RF coil
TR001	45428	SMD-Baluntransformator	SMD balun transformer
TR002	45428	SMD-Baluntransformator	SMD balun transformer
TR101	45428	SMD-Baluntransformator	SMD balun transformer
TR102	45428	SMD-Baluntransformator	SMD balun transformer
U001	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U101	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y001	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y002	45703	Quarz 76,450000MHz	Crystal 76.450000MHz
Y003	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
Y004	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
Y101	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y104	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	70549	**Tuner-Modul A001 (470-598MHz)**	**Tuner assembly A001 (470-598MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C002	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C003	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C004	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C005	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C009	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C010	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C011	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C012	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C013	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C015	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C016	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C017	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C018	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C019	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C020	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C021	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C022	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C023	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C024	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C025	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C026	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C027	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C028	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C029	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C030	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C031	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C032	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C033	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C034	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C035	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C036	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C037	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C040	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C041	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C042	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C043	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C044	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C045	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C046	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C047	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C048	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C050	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C051	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C054	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C055	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C102	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C103	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C104	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C105	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C109	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C110	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C111	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C112	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C113	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C115	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C116	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C117	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C118	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C119	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C120	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C121	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C123	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C124	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C125	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R

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C126	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C127	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C128	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C129	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C130	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C131	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C132	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C133	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C134	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C135	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C136	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C140	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C141	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C142	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C143	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C144	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C145	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C146	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C147	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C148	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C150	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C151	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C154	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C155	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C205	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45896	SMD Trimmkondensator 2,0/10p	SMD capacitor variable 2.0/10p
C212	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C213	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C214	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C215	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C216	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C227	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C228	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C229	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C230	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C231	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C232	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C235	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C240	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C241	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C242	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C243	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C244	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C245	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C246	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C247	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C248	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R

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C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D001	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D101	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D200	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L002	45704	SMD Spule 22nH	SMD coil 22nH
L003	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L004	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L005	45681	SMD Spule 470nH	SMD coil 470nH
L006	45681	SMD Spule 470nH	SMD coil 470nH
L007	46559	SMD Spule 470nH	SMD coil 470nH
L008	46559	SMD Spule 470nH	SMD coil 470nH
L009	45683	SMD Spule 10uH	SMD coil 10uH
L010	45681	SMD Spule 470nH	SMD coil 470nH
L011	45682	SMD Spule 680nH	SMD coil 680nH
L012	45682	SMD Spule 680nH	SMD coil 680nH
L013	45683	SMD Spule 10uH	SMD coil 10uH
L014	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L015	34676	SMD Spule 1,5uH	SMD coil 1.5uH
L016	45704	SMD Spule 22nH	SMD coil 22nH
L017	45391	SMD Spule 82nH	SMD coil 82nH
L018	46559	SMD Spule 470nH	SMD coil 470nH
L019	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L020	45392	SMD Spule 100nH	SMD coil 100nH
L021	45392	SMD Spule 100nH	SMD coil 100nH
L101	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L102	45704	SMD Spule 22nH	SMD coil 22nH
L103	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L104	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L105	45681	SMD Spule 470nH	SMD coil 470nH
L106	45681	SMD Spule 470nH	SMD coil 470nH
L107	46559	SMD Spule 470nH	SMD coil 470nH
L108	46559	SMD Spule 470nH	SMD coil 470nH
L109	45683	SMD Spule 10uH	SMD coil 10uH
L110	45681	SMD Spule 470nH	SMD coil 470nH
L111	45682	SMD Spule 680nH	SMD coil 680nH
L112	45682	SMD Spule 680nH	SMD coil 680nH
L113	45683	SMD Spule 10uH	SMD coil 10uH
L114	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L116	45704	SMD Spule 22nH	SMD coil 22nH
L117	45391	SMD Spule 82nH	SMD coil 82nH
L205	46559	SMD Spule 470nH	SMD coil 470nH
L211	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L213	45681	SMD Spule 470nH	SMD coil 470nH
L215	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L224	45704	SMD Spule 22nH	SMD coil 22nH
L225	45681	SMD Spule 470nH	SMD coil 470nH
L228	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
Q001	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q002	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q003	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q004	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q005	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q006	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q101	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143

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Q102	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q103	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q104	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q105	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q106	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q207	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R002	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R003	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R005	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R006	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R010	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R011	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R012	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R013	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R014	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R020	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R021	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R022	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R023	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R024	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R025	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R026	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R027	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R028	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R029	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R040	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R041	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R042	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R043	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R045	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R046	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R047	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R048	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R049	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R050	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R051	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R052	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R053	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R101	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R102	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R103	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R105	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R106	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R110	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R111	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R112	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R113	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R114	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R120	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R121	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R122	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R123	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R124	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R125	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R126	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R127	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R128	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R129	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R140	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R141	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R142	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R143	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R145	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R146	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R147	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R148	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R149	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R150	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R151	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R152	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R153	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R200	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R206	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R210	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R214	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R218	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R240	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R241	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R242	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R243	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R502	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
T001	45823	SMD HF Spule	SMD RF coil
T002	45823	SMD HF Spule	SMD RF coil
T004	45823	SMD HF Spule	SMD RF coil
T101	45823	SMD HF Spule	SMD RF coil
T102	45823	SMD HF Spule	SMD RF coil
TR001	45428	SMD-Baluntransformator	SMD balun transformer
TR002	45428	SMD-Baluntransformator	SMD balun transformer
TR101	45428	SMD-Baluntransformator	SMD balun transformer
TR102	45428	SMD-Baluntransformator	SMD balun transformer
U001	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U101	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y001	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y002	45703	Quarz 76,450000MHz	Crystal 76.450000MHz
Y003	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
Y004	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
Y101	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y104	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	70550	**Tuner-Modul A001 (574-702MHz)**	**Tuner assembly A001 (574-702MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C002	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C003	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C004	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C005	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C008	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C009	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C010	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C011	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C012	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C013	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C014	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C015	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C016	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C017	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C018	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C019	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C020	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C021	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C022	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C023	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C024	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C025	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C026	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C027	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C028	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C029	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C030	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C031	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C032	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C033	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C034	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C035	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C036	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C037	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C040	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C041	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C042	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C043	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C044	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C045	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C046	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C047	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C048	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C050	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C051	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C054	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C055	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C102	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C103	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C104	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C105	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C108	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C109	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C110	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C111	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C112	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C113	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C114	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C115	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C116	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C117	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C118	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C119	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C120	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C121	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C123	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C124	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C125	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C126	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C127	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C128	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C129	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C130	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C131	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C132	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C133	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C134	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C135	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C136	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C140	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C141	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C142	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C143	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C144	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C145	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C146	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C147	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C148	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C150	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C151	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C154	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C155	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C205	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45896	SMD Trimmkondensator 2,0/10p	SMD capacitor variable 2.0/10p
C212	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C213	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C214	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C215	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C216	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C227	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C228	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C229	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C230	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C231	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C232	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C235	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C240	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C241	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C242	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C243	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C244	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C245	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C246	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C247	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C248	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D001	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D101	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L002	45704	SMD Spule 22nH	SMD coil 22nH
L003	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L004	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L005	45681	SMD Spule 470nH	SMD coil 470nH
L006	45681	SMD Spule 470nH	SMD coil 470nH
L007	46559	SMD Spule 470nH	SMD coil 470nH
L008	46559	SMD Spule 470nH	SMD coil 470nH
L009	45683	SMD Spule 10uH	SMD coil 10uH
L010	45681	SMD Spule 470nH	SMD coil 470nH
L011	45682	SMD Spule 680nH	SMD coil 680nH
L012	45682	SMD Spule 680nH	SMD coil 680nH
L013	45683	SMD Spule 10uH	SMD coil 10uH
L014	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L015	34676	SMD Spule 1,5uH	SMD coil 1.5uH
L016	45704	SMD Spule 22nH	SMD coil 22nH
L017	45391	SMD Spule 82nH	SMD coil 82nH
L018	46559	SMD Spule 470nH	SMD coil 470nH
L019	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L020	45392	SMD Spule 100nH	SMD coil 100nH
L021	45392	SMD Spule 100nH	SMD coil 100nH
L101	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L102	45704	SMD Spule 22nH	SMD coil 22nH
L103	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L104	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L105	45681	SMD Spule 470nH	SMD coil 470nH
L106	45681	SMD Spule 470nH	SMD coil 470nH
L107	46559	SMD Spule 470nH	SMD coil 470nH
L108	46559	SMD Spule 470nH	SMD coil 470nH
L109	45683	SMD Spule 10uH	SMD coil 10uH
L110	45681	SMD Spule 470nH	SMD coil 470nH
L111	45682	SMD Spule 680nH	SMD coil 680nH
L112	45682	SMD Spule 680nH	SMD coil 680nH
L113	45683	SMD Spule 10uH	SMD coil 10uH
L114	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L116	45704	SMD Spule 22nH	SMD coil 22nH
L117	45391	SMD Spule 82nH	SMD coil 82nH
L205	46559	SMD Spule 470nH	SMD coil 470nH
L211	45849	SMD Luftspule 18,5nH	SMD air core coil 18.5nH
L213	45681	SMD Spule 470nH	SMD coil 470nH
L215	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L224	45704	SMD Spule 22nH	SMD coil 22nH
L225	45681	SMD Spule 470nH	SMD coil 470nH
L228	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
Q001	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q002	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q003	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q004	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23

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Q005	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q006	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q101	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q102	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q103	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q104	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q105	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q106	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q207	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R002	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R003	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R005	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R006	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R010	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R011	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R012	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R013	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R014	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R020	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R021	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R022	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R023	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R024	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R025	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R026	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R027	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R028	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R029	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R040	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R041	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R042	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R043	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R045	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R046	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R047	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R048	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R049	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R050	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R051	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R052	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R053	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R101	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R102	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R103	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R105	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R106	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R110	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R111	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R112	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R113	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R114	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R120	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R121	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R122	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R123	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R124	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R125	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R126	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R127	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R128	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R129	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R140	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R141	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R142	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R143	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R145	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R146	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R147	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R148	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R149	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R150	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R151	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R152	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R153	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R200	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R206	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R210	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R214	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R218	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R240	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R241	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R242	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R243	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R503	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
T001	45823	SMD HF Spule	SMD RF coil
T002	45823	SMD HF Spule	SMD RF coil
T004	45823	SMD HF Spule	SMD RF coil
T101	45823	SMD HF Spule	SMD RF coil
T102	45823	SMD HF Spule	SMD RF coil
TR001	45428	SMD-Baluntransformator	SMD balun transformer
TR002	45428	SMD-Baluntransformator	SMD balun transformer
TR101	45428	SMD-Baluntransformator	SMD balun transformer
TR102	45428	SMD-Baluntransformator	SMD balun transformer
U001	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U101	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y001	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y002	45703	Quarz 76,450000MHz	Crystal 76.450000MHz
Y003	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
Y004	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
Y101	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y104	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	70551	**Tuner-Modul A001 (678-824MHz)**	**Tuner assembly A001 (678-824MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C002	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C003	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C004	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C005	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C008	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NP0
C009	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C010	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C011	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C012	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C013	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C014	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C015	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C016	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C017	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C018	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C019	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C020	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C021	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C022	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C023	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C024	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C025	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C026	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C027	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C028	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C029	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C030	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C031	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C032	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C033	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C034	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NP0
C035	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C036	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C037	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C040	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C041	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C042	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C043	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C044	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C045	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C046	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C047	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C048	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C050	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C051	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C054	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C055	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C102	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C103	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C104	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C105	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C108	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NP0
C109	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C110	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C111	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C112	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C113	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C114	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C115	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C116	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C117	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C118	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C119	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C120	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C121	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805

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C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C123	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C124	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C125	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C126	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C127	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C128	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C129	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C130	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C131	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C132	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C133	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C134	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C135	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C136	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C140	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C141	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C142	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C143	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C144	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C145	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C146	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C147	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C148	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C150	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C151	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C154	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C155	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C205	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45896	SMD Trimmkondensator 2,0/10p	SMD capacitor variable 2.0/10p
C212	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C213	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C214	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C215	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C216	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C227	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C228	45365	SMD Trimmkondensator 3,0/10pF	SMD capacitor variable 3.0/10pF
C229	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C230	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C231	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C232	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C235	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C240	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C241	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C242	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C243	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C244	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C245	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C246	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C247	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C248	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805

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C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D001	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D101	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L002	45704	SMD Spule 22nH	SMD coil 22nH
L003	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L004	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L005	45681	SMD Spule 470nH	SMD coil 470nH
L006	45681	SMD Spule 470nH	SMD coil 470nH
L007	46559	SMD Spule 470nH	SMD coil 470nH
L008	46559	SMD Spule 470nH	SMD coil 470nH
L009	45683	SMD Spule 10uH	SMD coil 10uH
L010	45681	SMD Spule 470nH	SMD coil 470nH
L011	45682	SMD Spule 680nH	SMD coil 680nH
L012	45682	SMD Spule 680nH	SMD coil 680nH
L013	45683	SMD Spule 10uH	SMD coil 10uH
L014	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L015	34676	SMD Spule 1,5uH	SMD coil 1.5uH
L016	45704	SMD Spule 22nH	SMD coil 22nH
L017	45391	SMD Spule 82nH	SMD coil 82nH
L018	46559	SMD Spule 470nH	SMD coil 470nH
L019	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L020	45392	SMD Spule 100nH	SMD coil 100nH
L021	45392	SMD Spule 100nH	SMD coil 100nH
L101	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L102	45704	SMD Spule 22nH	SMD coil 22nH
L103	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L104	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L105	45681	SMD Spule 470nH	SMD coil 470nH
L106	45681	SMD Spule 470nH	SMD coil 470nH
L107	46559	SMD Spule 470nH	SMD coil 470nH
L108	46559	SMD Spule 470nH	SMD coil 470nH
L109	45683	SMD Spule 10uH	SMD coil 10uH
L110	45681	SMD Spule 470nH	SMD coil 470nH
L111	45682	SMD Spule 680nH	SMD coil 680nH
L112	45682	SMD Spule 680nH	SMD coil 680nH
L113	45683	SMD Spule 10uH	SMD coil 10uH
L114	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L116	45704	SMD Spule 22nH	SMD coil 22nH
L117	45391	SMD Spule 82nH	SMD coil 82nH
L205	46559	SMD Spule 470nH	SMD coil 470nH
L211	45685	SMD Luftspule 12,5nH	SMD air core coil 12.5nH
L213	45681	SMD Spule 470nH	SMD coil 470nH
L215	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L224	45704	SMD Spule 22nH	SMD coil 22nH
L225	45681	SMD Spule 470nH	SMD coil 470nH
L228	45725	SMD Luftspule 8nH	SMD air core coil 8nH
Q001	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q002	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q003	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q004	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23

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Q005	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q006	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q101	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q102	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q103	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q104	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q105	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q106	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q207	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R002	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R003	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R005	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R006	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R010	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R011	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R012	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R013	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R014	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R020	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R021	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R022	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R023	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R024	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R025	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R026	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R027	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R028	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R029	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R040	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R041	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R042	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R043	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R045	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R046	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R047	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R048	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R049	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R050	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R051	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R052	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R053	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R101	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R102	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R103	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R105	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R106	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R110	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R111	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R112	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R113	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R114	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R120	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R121	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R122	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R123	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R124	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R125	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R126	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R127	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R128	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R129	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R140	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R141	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R142	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R143	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R145	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R146	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R147	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R148	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R149	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R150	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R151	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R152	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R153	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R200	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R206	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R210	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R214	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R215	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R216	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R218	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R240	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R241	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R242	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R243	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R504	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
T001	45823	SMD HF Spule	SMD RF coil
T002	45823	SMD HF Spule	SMD RF coil
T004	45823	SMD HF Spule	SMD RF coil
T101	45823	SMD HF Spule	SMD RF coil
T102	45823	SMD HF Spule	SMD RF coil
TR001	45428	SMD-Baluntransformator	SMD balun transformer
TR002	45428	SMD-Baluntransformator	SMD balun transformer
TR101	45428	SMD-Baluntransformator	SMD balun transformer
TR102	45428	SMD-Baluntransformator	SMD balun transformer
U001	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U101	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y001	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y002	45703	Quarz 76,450000MHz	Crystal 76.450000MHz
Y003	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
Y004	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
Y101	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y104	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	70552	**Tuner-Modul A001 (800-960MHz)**	**Tuner assembly A001 (800-960MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C002	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C003	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C004	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C005	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C009	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C010	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C011	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C012	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C013	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C014	45740	SMD Kondensator KERKO 1,2pF 50V NP0	SMD capacitor KERKO 1.2pF 50V NPO
C015	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C016	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C017	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C018	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C019	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C020	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C021	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C022	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C023	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C024	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C025	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C026	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C027	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C028	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C029	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C030	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C031	45181	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NPO
C032	45182	SMD Kondensator KERKO 47pF 50V NP0	SMD capacitor KERKO 47pF 50V NPO
C033	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C034	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C035	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C036	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C037	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C040	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C041	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C042	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C043	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C044	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C045	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C046	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C047	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C048	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C050	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C051	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C054	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C055	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C102	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C103	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C104	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C105	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C109	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C110	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C111	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C112	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C113	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C114	45740	SMD Kondensator KERKO 1,2pF 50V NP0	SMD capacitor KERKO 1.2pF 50V NPO
C115	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C116	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C117	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C118	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C119	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C120	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C121	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C123	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805

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C124	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C125	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C126	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C127	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C128	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C129	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C130	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C131	45181	SMD Kondensator KERKO 39pF 50V NPO	SMD capacitor KERKO 39pF 50V NPO
C132	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C133	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C134	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C135	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C136	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C140	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C141	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C142	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C143	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C144	29149	SMD Kondensator KERKO 390pF 50V NP0 0805	SMD capacitor KERKO 390pF 50V NP0 0805
C145	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C146	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C147	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C148	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C150	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C151	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C154	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C155	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C205	45193	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45896	SMD Trimmkondensator 2,0/10p	SMD capacitor variable 2.0/10p
C212	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C213	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C214	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C215	29012	SMD Kondensator KERKO 1,5pF 50V NP0 0805	SMD capacitor KERKO 1.5pF 50V NP0 0805
C216	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C227	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C228	45364	SMD Trimmkondensator 2,0/6,0pF	SMD capacitor variable 2.0/6.0pF
C229	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C230	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C231	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C232	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C235	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C240	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C241	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C242	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C243	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C244	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C245	45182	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C246	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C247	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C248	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D001	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D101	45047	SMD SKY Diode BAT54 SOT23	SMD SKY diode BAT54 SOT23
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L002	45704	SMD Spule 22nH	SMD coil 22nH
L003	45725	SMD Luftspule 8nH	SMD air core coil 8nH
L004	45725	SMD Luftspule 8nH	SMD air core coil 8nH
L005	45681	SMD Spule 470nH	SMD coil 470nH
L006	45681	SMD Spule 470nH	SMD coil 470nH
L007	46559	SMD Spule 470nH	SMD coil 470nH
L008	46559	SMD Spule 470nH	SMD coil 470nH
L009	45683	SMD Spule 10uH	SMD coil 10uH
L010	45681	SMD Spule 470nH	SMD coil 470nH
L011	45682	SMD Spule 680nH	SMD coil 680nH
L012	45682	SMD Spule 680nH	SMD coil 680nH
L013	45683	SMD Spule 10uH	SMD coil 10uH
L014	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L015	34676	SMD Spule 1,5uH	SMD coil 1.5uH
L016	45704	SMD Spule 22nH	SMD coil 22nH
L017	45388	SMD Spule 47nH	SMD coil 47nH
L018	45681	SMD Spule 470nH	SMD coil 470nH
L019	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L020	45392	SMD Spule 100nH	SMD coil 100nH
L021	45392	SMD Spule 100nH	SMD coil 100nH
L101	45684	SMD Luftspule 2,5nH	SMD air core coil 2.5nH
L102	45704	SMD Spule 22nH	SMD coil 22nH
L103	45725	SMD Luftspule 8nH	SMD air core coil 8nH
L104	45725	SMD Luftspule 8nH	SMD air core coil 8nH
L105	45681	SMD Spule 470nH	SMD coil 470nH
L106	45681	SMD Spule 470nH	SMD coil 470nH
L107	46559	SMD Spule 470nH	SMD coil 470nH
L108	46559	SMD Spule 470nH	SMD coil 470nH
L109	45683	SMD Spule 10uH	SMD coil 10uH
L110	45681	SMD Spule 470nH	SMD coil 470nH
L111	45682	SMD Spule 680nH	SMD coil 680nH
L112	45682	SMD Spule 680nH	SMD coil 680nH
L113	45683	SMD Spule 10uH	SMD coil 10uH
L114	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L116	45704	SMD Spule 22nH	SMD coil 22nH
L117	45388	SMD Spule 47nH	SMD coil 47nH
L205	45681	SMD Spule 470nH	SMD coil 470nH
L211	45725	SMD Luftspule 8nH	SMD air core coil 8nH
L213	45681	SMD Spule 470nH	SMD coil 470nH
L215	45705	SMD Spule 220nH SUP8	SMD coil 220nH SUP8
L224	45704	SMD Spule 22nH	SMD coil 22nH
L225	45681	SMD Spule 470nH	SMD coil 470nH
L228	45725	SMD Luftspule 8nH	SMD air core coil 8nH
Q001	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q002	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q003	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q004	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q005	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q006	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23

POS	IDENT	BEZEICHNUNG	DESCRIPTION
Q101	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q102	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q103	45480	SMD Transistor BFR106 SOT23	SMD transistor BFR106 SOT23
Q104	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q105	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q106	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q207	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R002	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R003	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R005	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R006	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R010	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R011	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R012	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R013	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R014	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R020	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R021	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R022	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R023	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R024	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R025	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R026	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R027	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R028	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R029	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R040	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R041	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R042	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R043	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R045	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R046	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R047	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R048	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R049	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R050	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R051	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R052	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R053	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R101	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R102	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R103	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R105	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R106	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R110	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R111	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R112	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R113	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R114	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R120	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R121	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R122	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R123	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R124	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R125	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R126	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R127	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R128	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R129	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R140	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R141	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R142	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R143	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R145	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R146	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R147	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R148	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R149	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R150	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R151	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R152	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R153	45206	SMD Widerstand 270R 5% 0603	SMD resistor 270R 5% 0603
R200	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R206	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R210	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R214	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R215	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R216	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R218	45217	SMD Widerstand 18k 5% 0603	SMD resistor 18k 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R240	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R241	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R242	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R243	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R505	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
T001	45823	SMD HF Spule	SMD RF coil
T002	45823	SMD HF Spule	SMD RF coil
T004	45823	SMD HF Spule	SMD RF coil
T101	45823	SMD HF Spule	SMD RF coil
T102	45823	SMD HF Spule	SMD RF coil
TR001	45428	SMD-Baluntransformator	SMD balun transformer
TR002	45428	SMD-Baluntransformator	SMD balun transformer
TR101	45428	SMD-Baluntransformator	SMD balun transformer
TR102	45428	SMD-Baluntransformator	SMD balun transformer
U001	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U101	44138	SMD IC GN2011QTX	SMD IC GN2011QTX
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y001	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y002	45703	Quarz 76,450000MHz	Crystal 76.450000MHz
Y003	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
Y004	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
Y101	45678	Filter OFW 65,75MHz	Filter OFW 65.75MHz
Y104	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

15 ZF-MODUL A002

15.1 BESCHREIBUNG

Zwei Module mit den Abmessungen 50,8 x 17 mm sind senkrecht in die Tunerplatine eingelötet und dienen zur Verstärkung, Begrenzung und Demodulation der beiden FM-modulierten ZF-Signale des Tuners. Die Bandbegrenzung erfolgt durch zwei in Reihe geschaltete Keramikfilter. Der NF-Pegel wird mit Hilfe eines Operationsverstärkers auf 0 dBu bei Nennhub (40 kHz) eingestellt.

Zusätzlich erzeugt dieses Modul ein feldstärkeabhängiges Ausgangssignal. Diese Spannung hat eine logarithmische Abhängigkeit von der Feldstärke und eine Dynamik von ca. 70 dB.

NOTIZEN:

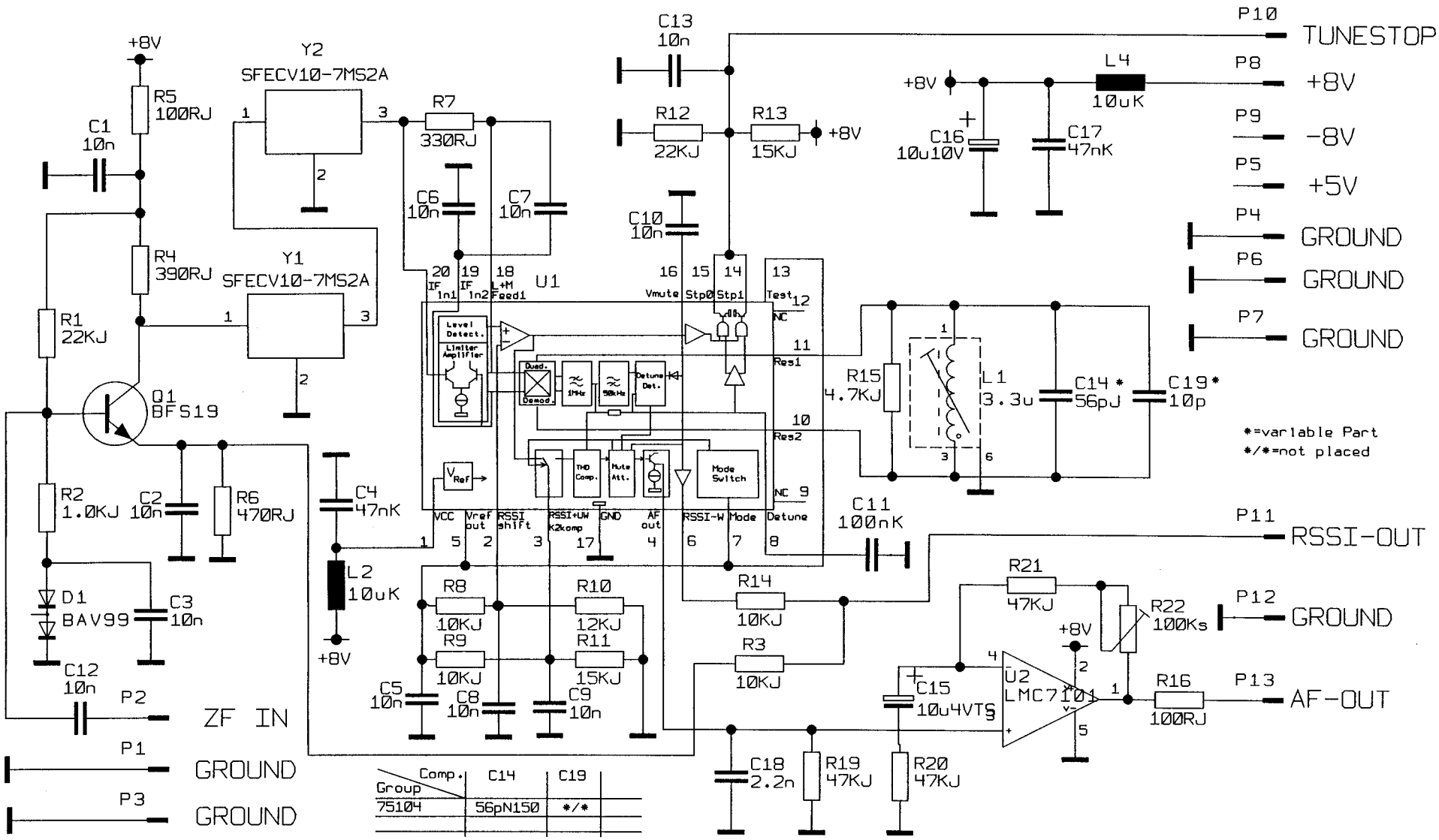
15 IF ASSEMBLY A002

15.1 DESCRIPTION

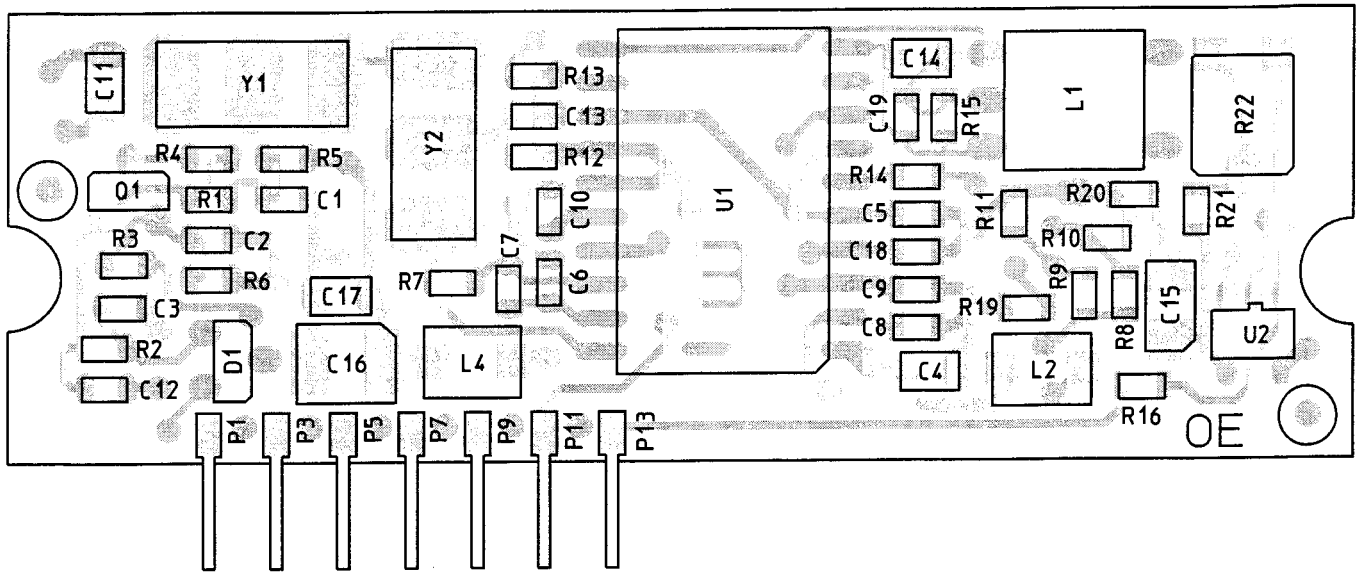
Two assemblies of 50.8 x 17 mm are vertically soldered to the tuner circuit board and serve to amplify, limit and demodulate the two FM-modulated IF signals of the tuner. The bandwidth is limited by two ceramic filters connected in series. By means of an operational amplifier the AF level is adjusted to 0 dBu with nominal deviation (40 kHz).

In addition, the IF assembly produces an output signal that is dependent on the fieldstrength. The signal voltage is a logarithmic function of the fieldstrength and has a dynamic range of approx. 70 dB.

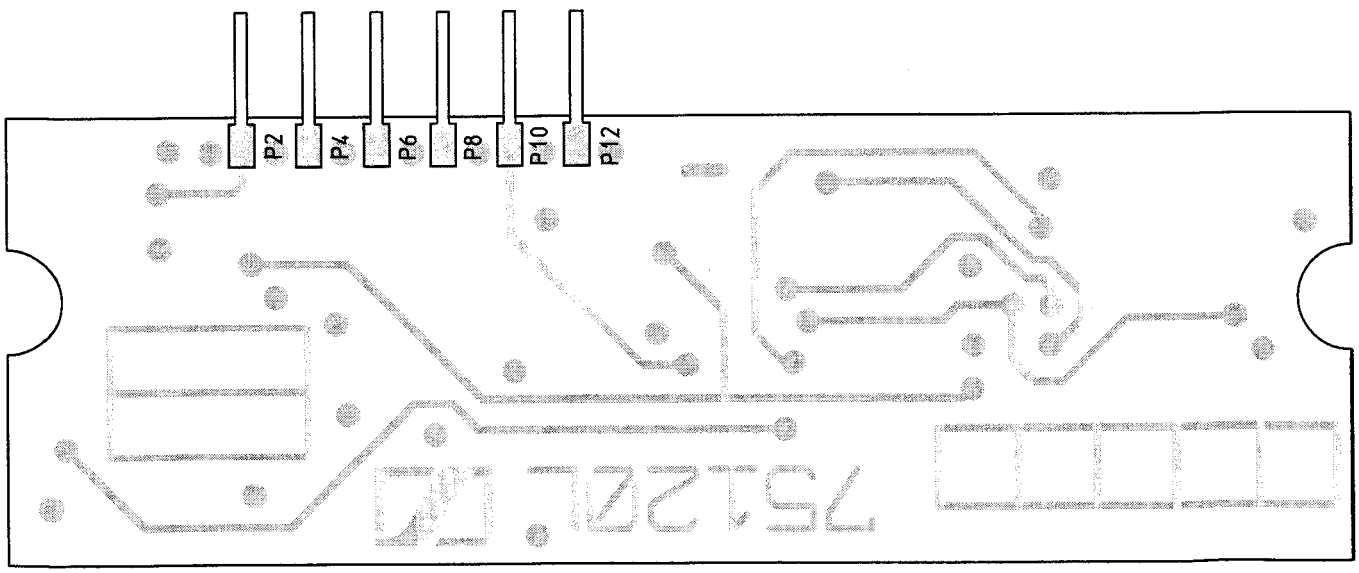
NOTES:



ZF-MODUL A002, STROMLAUFPLAN
IF ASSEMBLY A002, CIRCUIT DIAGRAM



ZF-MODUL A002, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
IF ASSEMBLY A002, PRINTED CIRCUIT BOARD, COMPONENT SIDE



ZF-MODUL A002, GEDRUCKTE SCHALTUNG, LÖTSEITE
IF ASSEMBLY A002, PRINTED CIRCUIT BOARD, SOLDER SIDE

PIN No.	Signal	IN OUT	Level	Ri	Pull up
1	GND	IN	%	%	
2	IF-IN	IN	100mV max	330R	
3	GND	IN	%	%	
4	GND ⏚	IN	%	%	
5	NC				
6	GND	IN	%	%	
7	GND	IN	%	%	
8	+8V	IN	Power	I_N = 23mA	
9	NC				
10	TUNE STOP	OUT	0 / 5V	10k	
11	RSSI	OUT	0 - 4,5V	≤ $5K_2$	
12	GND	IN	%	%	
13	AF OUT	OUT	0dBU (40kHz dev)	≤ 100R	

ZF-MODUL A002, PINBELEGUNG
IF ASSEMBLY A002, PIN ASSIGNMENTS

characteristics	datas
mechanical datas	50,8x17mm
weight	approx. 3gr
assignment	13 soldercontacts 2x2,54mm separation 2,5mm
input IF 10,7MHz	Pin 2
max. level	100mV
Ri	330R
output AF	nom 0dBu max 6dBu PIN13 (DC-Level approx. 3V)
frequency response (no load)	0-25kHz ±1dB 40Hz-20kHz ±0,2dB
Ri (source Ri=0)	≤ 100Ω
THD (40Hz-20kHz)	≤ 0,4%
noisefloor	-68dBu (timeconstant 50µs)
output RSSI	Pin 11 Ri ≤ 10kΩ
no IF-Signal	approx. 0,6V
10mV IF-Signal	approx. 3,5V
output TUNESTOP	Pin 10 Ri ≤ 10k
high (≥ 4V)	10,7MHz ±15kHz
low (≤ 1V)	other frequencies
supply voltage	PIN8 +8V DC
current	23mA
temp.range	-10°C to +70°C

ZF-MODUL A002, TECHNISCHE DATEN
IF ASSEMBLY A002, TECHNICAL DATA

16 SCHALT-MODUL A003

16.1 BESCHREIBUNG

Dieses Modul mit den Abmessungen 50,8 x 25 mm ist senkrecht in die Grundplatte eingelötet und dient zur Vorverarbeitung von zwei NF-Signalen bei "TRUE-DIVERSITY" Receivern. Es besitzt in jedem NF-Eingang einen Analogschalter (U2-2, U2-3), mit dem eines der beiden Signale ausgewählt wird (Diversityschalter). Diesem Umschalter nachgeschaltet sind zwei weitere Analogschalter (U2-1, U2-4), die an ihren Ausgängen miteinander verbunden sind, und von denen einer mit dem über einen OP (U3-2) invertierten NF-Signal angesteuert wird. Diese Schalter können einzeln gesteuert werden und dienen als Squelchschalter. Die Auswahl der richtigen Phasenlage erfolgt über das Prozessormodul.

Als weitere Funktion ist auf diesem Modul die Batteriesignaldetektion implementiert. Das Signal wird am NF-Ausgang über einen 5 Hz-Tiefpaß (U1-1, U1-4) ausgekoppelt und in Impulse mit Logikpegel umgeformt (U1-2, U1-3) die an einem Ausgang zur Verfügung stehen.

Zusätzlich enthält dieses Modul eine Auswerteschaltung (Bandpaß mit Gleichrichter und Trigger, U3-3, U3-4, U3-1) über die dem Prozessormodul ein Schaltsignal zur Verfügung gestellt wird wenn im ausgewählten NF-Kanal bei hohen Frequenzen (ca. 50 kHz) der Geräuschabstand über eine feste Schwelle ansteigt. Daraus kann ein Squelchkriterium abgeleitet werden.

NOTIZEN:

16 DIVERSITY ASSEMBLY A003

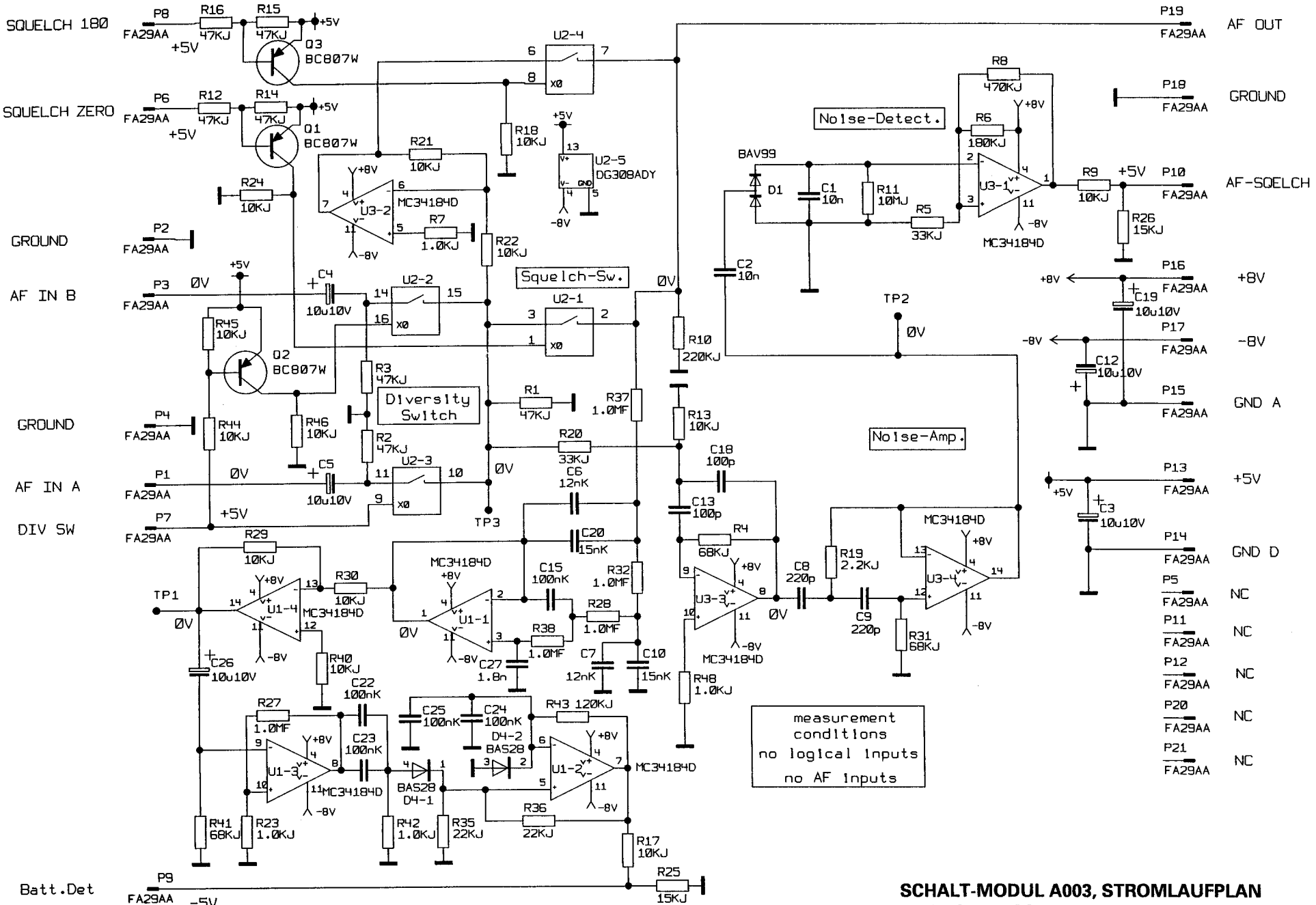
16.1 DESCRIPTION

The Diversity assembly of 50.8 x 25 mm is vertically soldered to the main PCB and serves to pre-process the two AF signals for true diversity reception. It has an analogue switch (U2-2, U2-3) in each input with which one of the two signals is selected (diversity switch). Subsequent to the diversity switch are two further analogue switches (U2-1, U2-4) which are interconnected at their outputs and one of which is addressed by an AF signal inverted via an operational amplifier (U3-2). These switches can be controlled separately, and they serve as squelch switches. The correct phase position is selected via the processor assembly.

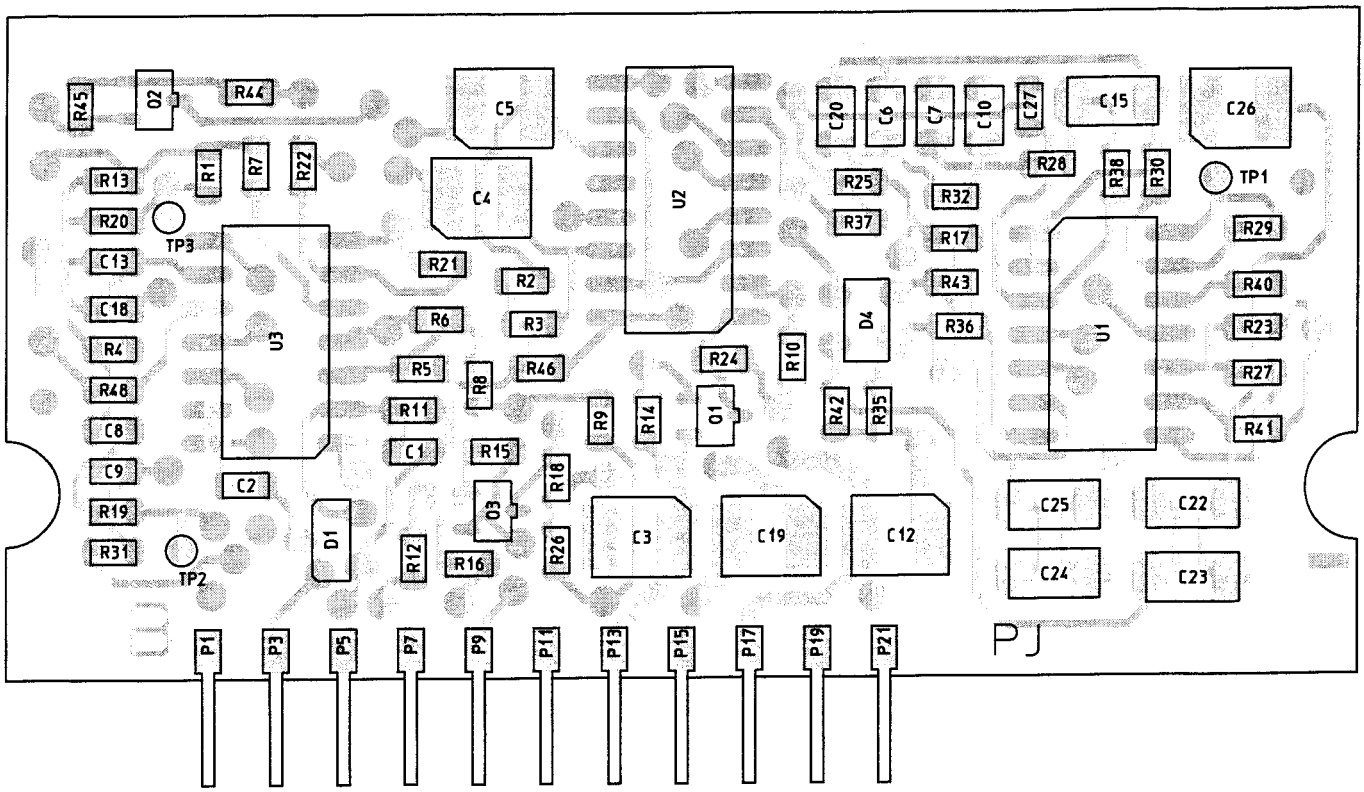
This assembly also accommodates the LOW BATT detector. The signal is decoupled at the AF output via a 5 Hz low-pass filter (U1-1, U1-4) and converted into pulses with a logical level (U1-2, U1-3), which are available at one of the outputs.

In addition, this assembly contains an evaluation circuit (band pass with rectifier and trigger, U3-3, U3-4, U3-1) through which a switching signal is transmitted to the processor assembly when the signal-to-noise ratio at high frequencies (approx. 50 kHz) in the selected AF channel exceeds a certain threshold. A squelch criterion can then be deduced.

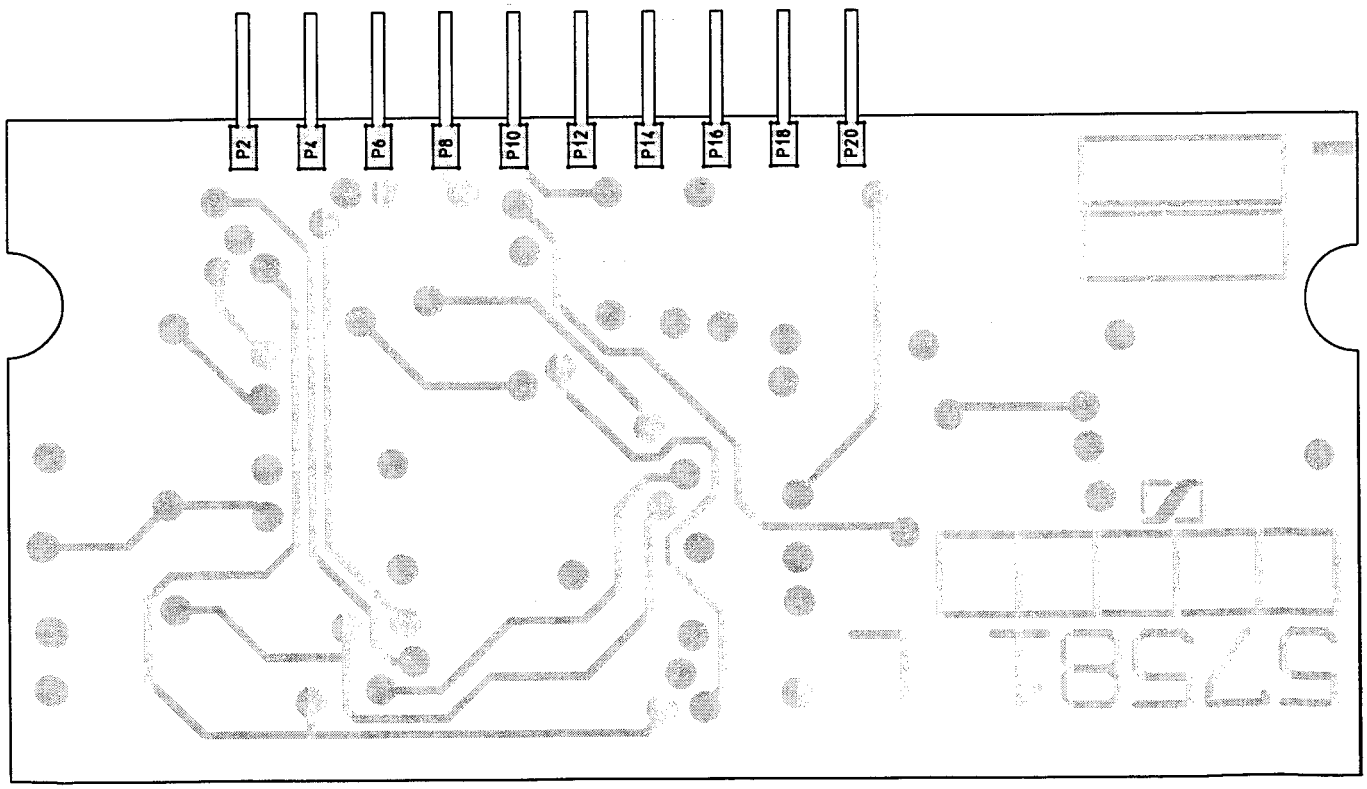
NOTES:



SCHALT-MODUL A003, STROMLAUFPLAN
DIVERSITY ASSEMBLY A003, CIRCUIT DIAGRAM



SCHALT-MODUL A003, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
DIVERSITY ASSEMBLY A003, PRINTED CIRCUIT BOARD, COMPONENT SIDE



SCHALT-MODUL A003, GEDRUCKTE SCHALTUNG, LÖTSEITE
DIVERSITY ASSEMBLY A003, PRINTED CIRCUIT BOARD, SOLDER SIDE

PIN No.	Signal	in out	Level	Ri	Pull up
1	AF in A	in	12dBu/max	6k (no load)	
2	GND ⏚	in	%	%	
3	AF in B	in	12dBu/max	6k (no load)	
4	GND ⏚	in	%	%	
5	NC				
6	AF 180°				47k
7	Div.sw.	in	0/5V 0=B on		10k
8	AF 0°				47k
9	Batt Det	out	+5V ... -5V ⎍	6k	
10	AF SQ	out	+5V ... -5V	6k	
11	NC				
12	NC				
13	+5V	in			
14	GND ⏚	in			
15	GND ⏚	in			
16	+8V	in			
17	-8V	in			
18	GND ⏚	in			
19	AF out	out	12dBu max	≤ 100R. (Source Ri=0)	
20	NC				
21	NC				

SCHALT-MODUL A003, PINBELEGUNG
DIVERSITY ASSEMBLY A003, PIN ASSIGNMENTS

characteristics	datas
mechanical datas	50.8x25x4mm
weight	approx. 5gr
assignment	21 soldercontacts 2x2.54mm separation 2.3mm
input AF A (B)	Pin 1 (Pin 3)
nom. level	0dBu
max. level	12dBu
Ri (no load)	≥6kΩ in series with 10µF
input DIV sw	Pin 7 Ri 10kΩ
high (≥ 4V)	channel AF-A switched on
low (≥ 1V)	channel AF-B switched on
input squelch 0°	Pin 6 Ri 47kΩ
high (≥ 4V)	mute
low (≥ 1V)	AF 0° switched on
input squelch 180°	Pin 8 Ri 47kΩ
high (≥ 4V)	mute
low (≥ 1V)	AF 180° switched on
output AF	nom 0dBu max 12dBu
frequency response (no load)	5Hz - 40Hz +0 - 1dB 40Hz - 20kHz ±0.2dB
Ri (source Ri=0)	≤ 100Ω in series with 10µF
THD (40Hz - 20kHz)	≤ 0.15%
noisefloor	0° ≤ -110dBu 180° ≤ - 90dBu
output Batt.detect	Pin 9
pulse	20ms ± 5ms (input (Pin1,Pin3) ≥20mV 5Hz)
output AF squelch	Pin 10
high	+5V ±0.5V (input (Pin1,Pin3) 55kHz ≤0.25V eff)
low	-5V ±0.5V (input (Pin1,Pin3) 55kHz ≥0.85V eff)
clicks Pin 19 (switchover div A/B and squelch 0/180°)	≤-75dBu (with AF Meter peak/unw.) (DC at Pin 1,3 +5V)
feed trough	
channel A/B in to AF out	≥75dB
mute 0/180 to AF out	≥90dB
supply voltage	±8V, +5V DC
current	≤2mA (all supply Volt.)
temp.range	-10°C to +70°C

SCHALT-MODUL A003, TECHNISCHE DATEN
DIVERSITY ASSEMBLY A003, TECHNICAL DATA

16.6 ERSATZTEILE

16.6 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C001	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C002	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C003	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C004	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C005	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C006	32232	SMD Kondensator KERKO 12nF 50V X7R 0805	SMD capacitor KERKO 12nF 50V X7R 0805
C007	32232	SMD Kondensator KERKO 12nF 50V X7R 0805	SMD capacitor KERKO 12nF 50V X7R 0805
C008	45191	SMD Kondensator KERKO 220pF 50V X7R	SMD capacitor KERKO 220pF 50V X7R
C009	45191	SMD Kondensator KERKO 220pF 50V X7R	SMD capacitor KERKO 220pF 50V X7R
C010	29403	SMD Kondensator KERKO 15nF 50V X7R	SMD capacitor KERKO 15nF 50V X7R
C012	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C013	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C015	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C018	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C019	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C020	29403	SMD Kondensator KERKO 15nF 50V X7R	SMD capacitor KERKO 15nF 50V X7R
C022	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C023	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C024	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C025	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C026	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C027	44869	SMD Kondensator KERKO 1,8nF 50V X7R	SMD capacitor KERKO 1.8nF 50V X7R
D001	32642	SMD Doppeldiode BAV99 SOT23	SMD double diode BAV99 SOT23
D004	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
P001	45782	Kontakt 0,4x0,25 (P001-P021)	Contact 0.4x0.25 (P001-P021)
Q001	45816	SMD Transistor BC807W SOT323	SMD transistor BS807W SOT323
Q002	45816	SMD Transistor BC807W SOT323	SMD transistor BS807W SOT323
Q003	45816	SMD Transistor BC807W SOT323	SMD transistor BS807W SOT323
R001	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R002	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R003	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R004	45143	SMD Widerstand 68k 5% 0603	SMD resistor 68k 5% 0603
R005	45141	SMD Widerstand 33k 5% 0603	SMD resistor 33k 5% 0603
R006	45223	SMD Widerstand 180k 5% 0603	SMD resistor 180k 5% 0603
R007	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R008	45148	SMD Widerstand 470k 5% 0603	SMD resistor 470k 5% 0603
R009	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R010	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R011	45153	SMD Widerstand 10M 10% 0603	SMD resistor 10M 10% 0603
R012	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R013	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R014	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R015	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R016	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R017	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R018	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R019	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R020	45141	SMD Widerstand 33k 5% 0603	SMD resistor 33k 5% 0603
R021	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R022	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R023	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R024	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R025	45139	SMD Widerstand 15k 5% 0603	SMD resistor 15k 5% 0603
R026	45139	SMD Widerstand 15k 5% 0603	SMD resistor 15k 5% 0603
R027	71326	SMD Widerstand 1M 1% 0603	SMD resistor 1M 1% 0603
R028	71326	SMD Widerstand 1M 1% 0603	SMD resistor 1M 1% 0603
R029	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R030	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R031	45143	SMD Widerstand 68k 5% 0603	SMD resistor 68k 5% 0603
R032	71326	SMD Widerstand 1M 1% 0603	SMD resistor 1M 1% 0603
R035	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R036	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R037	71326	SMD Widerstand 1M 1% 0603	SMD resistor 1M 1% 0603
R038	71326	SMD Widerstand 1M 1% 0603	SMD resistor 1M 1% 0603
R040	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R041	45143	SMD Widerstand 68k 5% 0603	SMD resistor 68k 5% 0603
R042	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R043	45222	SMD Widerstand 120k 5% 0603	SMD resistor 120k 5% 0603
R044	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R045	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R046	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R048	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
U001	45713	SMD IC 4xFB.OP MC34184D	SMD IC 4xFB.OP MC34184D
U002	45445	IC 4xSchalter CMOS DG308ADY SO16	IC 4xswitch CMOS DG308ADY SO16
U003	45713	SMD IC 4xFB.OP MC34184D	SMD IC 4xFB.OP MC34184D

17 HDP-MODUL A004

17.1 BESCHREIBUNG

Dieses Modul mit den Abmessungen 50,8 x 25 mm ist senkrecht in die Grundplatte eingelötet. Es expandiert Empfängerseitig das komprimierte Sendersignal.

Das NF-Signal durchläuft einen 35 Hz-Hochpaß (U1-1, U1-4) mit 24 dB/Okt. und integrierter 50 µs-Deemphase. Es folgt ein 25 kHz-Tiefpaß (24 dB/Okt., U1-2, U1-3), der den Expander (U2) speist, um das komprimierte Sendesignal wieder 1:2 zu expandieren. Dieser versorgt die Endstufe (U3-1, U3-2), die gegenphasig je + 12 dB max. an 600 Ohm liefert. Die Ausgänge können mit "LOW"-Pegel vom Prozessor stummgeschaltet werden (Q2, Q3, Q1). Ein Spitzenwertgleichrichter (U4-1, U4-2) liefert eine Gleichspannung von 3 V bei Nennhub (4,5 V bei Spitzenhub) für die Anzeige des Senderhubes.

NOTIZEN:

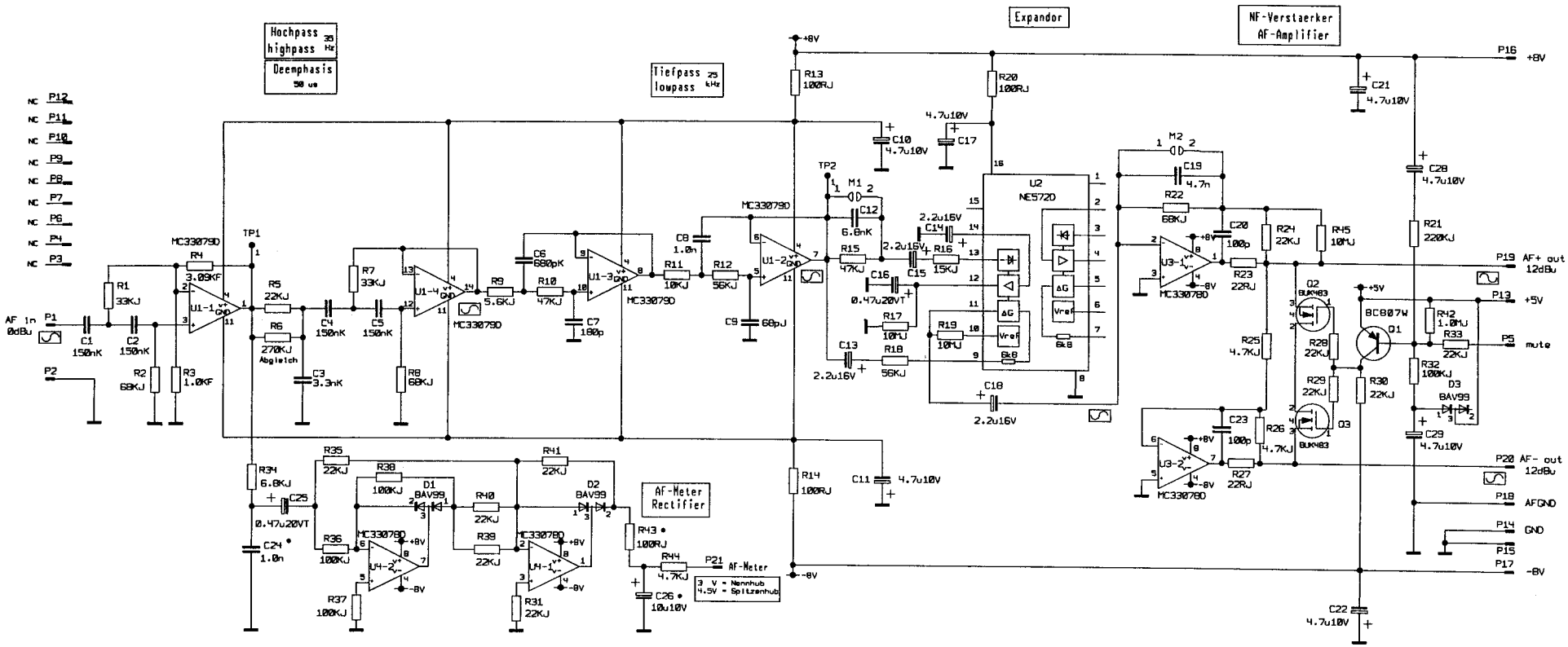
17 HDP ASSEMBLY A004

17.1 DESCRIPTION

The HDP assembly of 50.8 x 25 mm is vertically soldered to the main PCB. It expands the compressed transmitter signal at the receiver end.

The AF signal passes through a 35 Hz high-pass filter (U1-1, U1-4) with 24 dB/oct. and an integral 50 µs de-emphasis. The high-pass filter is followed by a 25 kHz low-pass filter (24 dB/oct., U1-2, U1-3) which feeds the expander (U2) in order to expand the compressed transmitter signal 1:2. The expander supplies the AF outputs (U3-1, U3-2), each of which supplies + 12 dB max. at 600 Ω in opposition of phase. The outputs can be muted by a "LOW" signal from the processor (Q2, Q3, Q1). A peak detector (U4-1, U4-2) supplies a DC voltage of 3 V at nominal deviation (4.5 V at peak deviation) for the display of the transmitter deviation.

NOTES:



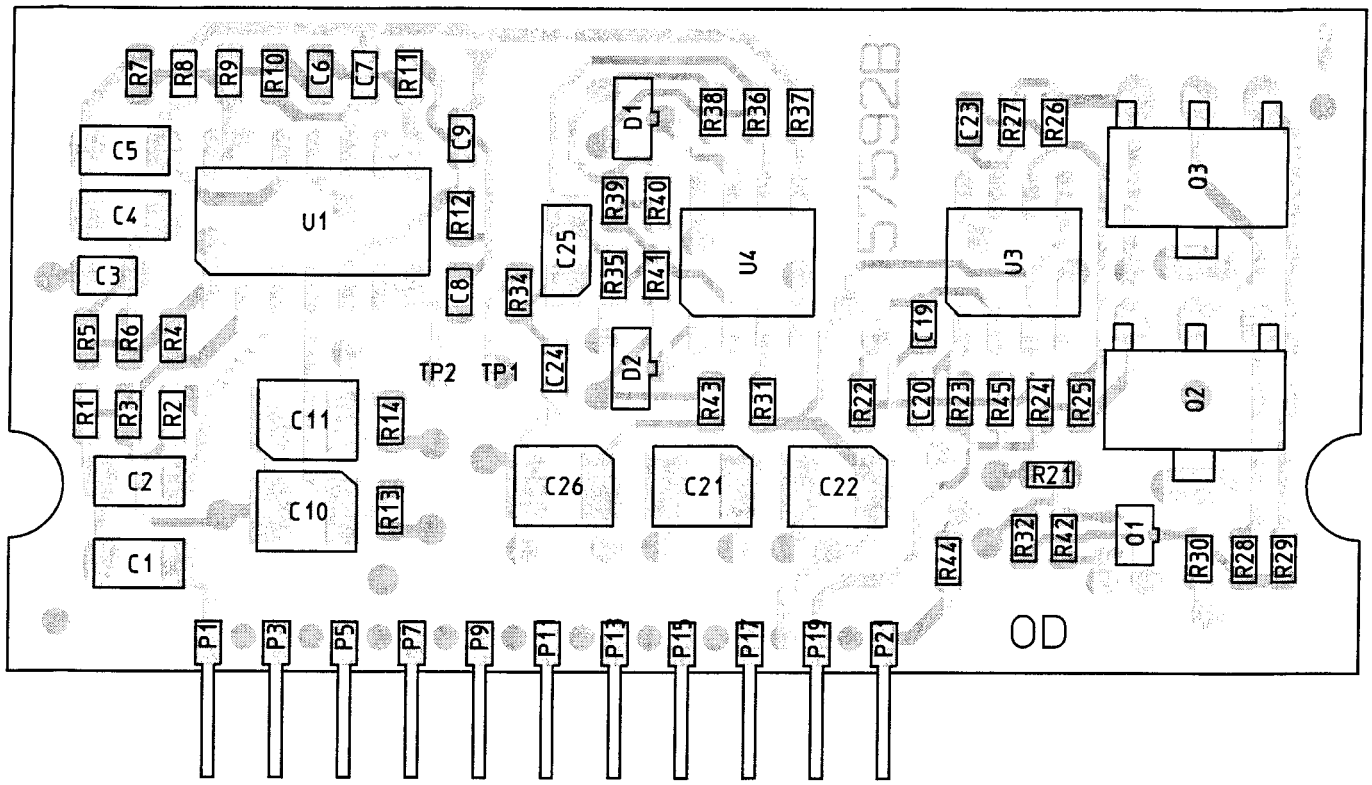
Modifcations to HI-DYN

M1	closed
M2	closed
C16	2.2uF 16V

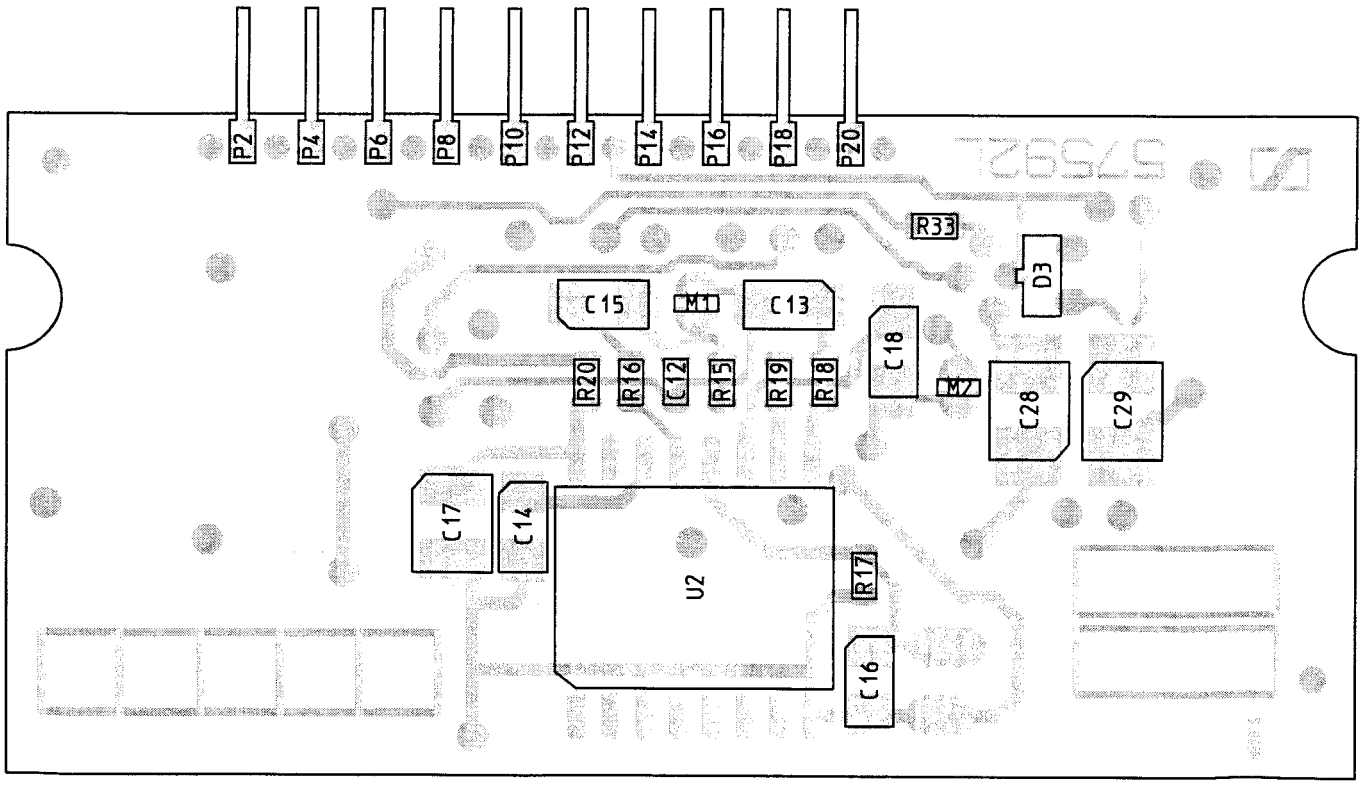
*/** not placed
** variable component

	C24	C26	R43
PCB 73748	*/*	.47u	0.0R
PCB 59216	*/*	10u	100R

HDP-MODUL A004, STROMLAUFPLAN
HDP ASSEMBLY A004, CIRCUIT DIAGRAM



HDP-MODUL A004, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
HDP ASSEMBLY A004, PRINTED CIRCUIT BOARD, COMPONENT SIDE



HDP-MODUL A004, GEDRUCKTE SCHALTUNG, LÖTSEITE
HDP ASSEMBLY A004, PRINTED CIRCUIT BOARD, SOLDER SIDE

PIN No.	Signal	in out	Level	Ri	Pull up
1	AF in A	in	3dBu/max	68k (no load)	
2	GND ⏚	in	%	%	
3	NC				
4	NC				
5	Mute	in			22k
6	NC				
7	NC				
8	NC				
9	NC				
10	NC				
11	NC				
12	NC				
13	+5V	in			
14	GND ⏚	in			
15	GND ⏚	in			
16	+8V	in			
17	-8V	in			
18	GND ⏚	in			
19	AF out	out	12dBu max	≤ 100R. (Source Ri=0)	
20	AF out	out	12dBu max	≤ 100R. (Source Ri=0)	
21	AF-Meter	out	+4,8V= max	Source 4,7k	

HDP-MODUL A004, PINBELEGUNG
HDP ASSEMBLY A004, PIN ASSIGNMENTS

characteristics	data
mechanical data	50,8 x 25 x 6 mm
weight	approx.5gr
assignment	21 soldercontacts 2x2,54mm separation 2,3mm
Compander-System	"HiDyn *plus*" 1:2
Distortion THD (1KHz, Dev.:40KHz)	< 0,5%
SNR: dB	110 (116)
nom (peak) dBA	114 (120)
40KHz(56KHz)CCIR	100 (106)
input AF(-)	pin 1 (neg. Phase)
nom. Level	0dBu
max. Level	3dBu
Ri	~ 68k
mute	pin 5 active low
output AF+ (AF-)	pin 19 (pin 20)
frequency response	nom. 6dBu, max. 12dBu 40Hz - 20kHz ± 2dB
output AF-Meter, Ri	pin 5, Ri= 4,7k
nom. Level	3,0V=
max. Level	4,5V=
Operting Voltages	+8V / -8V / +5V
currents	<40mA / <40mA / 0mA
temp.range	-10°C to +70°C

HDP-MODUL A004, TECHNISCHE DATEN
HDP ASSEMBLY A004, TECHNICAL DATA

17.6 ERSATZTEILE

17.6 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C001	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C002	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C003	29181	SMD Kondensator KERKO 3,3nF 50V X7R 0805	SMD capacitor KERKO 3.3nF 50V X7R 0805
C004	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C005	45239	SMD Kondensator KERKO 150nF 50V X7R	SMD capacitor KERKO 150nF 50V X7R
C006	45194	SMD Kondensator KERKO 680pF 50V X7R	SMD capacitor KERKO 680pF 50V X7R
C007	45190	SMD Kondensator KERKO 470pF 50V X7R	SMD capacitor KERKO 470pF 50V X7R
C008	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C009	45184	SMD Kondensator KERKO 68pF 50V NPO	SMD capacitor KERKO 68pF 50V NPO
C010	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
C011	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
C012	45200	SMD Kondensator KERKO 6,8nF 50V X7R	SMD capacitor KERKO 6.8nF 50V X7R
C013	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C014	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C015	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C016	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C017	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
C018	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C019	45199	SMD Kondensator KERKO 4,7nF 50V X7R	SMD capacitor KERKO 4.7nF 50V X7R
C020	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C021	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
C022	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
C023	45186	SMD Kondensator KERKO 100pF 50V NPO	SMD capacitor KERKO 100pF 50V NPO
C025	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C026	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C028	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
C029	45044	SMD Kondensator TA-KO 4,7uF 10V SUP8	SMD capacitor TA-KO 4.7uF 10V SUP8
D001	32642	SMD Doppeldiode BAV99 SOT23	SMD double diode BAV99 SOT23
D002	32642	SMD Doppeldiode BAV99 SOT23	SMD double diode BAV99 SOT23
D003	32642	SMD Doppeldiode BAV99 SOT23	SMD double diode BAV99 SOT23
P001	45782	Kontakt 0,4x0,25 (P001-P021)	Contact 0.4x0.25 (P001-P021)
Q001	45816	SMD Transistor BC807W SOT323	SMD transistor BS807W SOT323
Q002	45785	SMD Transistor BUK SOT323	SMD transistor BUK SOT323
Q003	45785	SMD Transistor BUK SOT323	SMD transistor BUK SOT323
R001	45141	SMD Widerstand 33k 5% 0603	SMD resistor 33k 5% 0603
R002	45143	SMD Widerstand 68k 5% 0603	SMD resistor 68k 5% 0603
R003	45729	SMD Widerstand Film 1k 1% 0603	SMD resistor film 1k 1% 0603
R004	71320	SMD Widerstand 3k09 1% 0603	SMD resistor 3k09 1% 0603
R005	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R006	45287	SMD Widerstand 270k 5% 0603	SMD resistor 270k 5% 0603
R007	45141	SMD Widerstand 33k 5% 0603	SMD resistor 33k 5% 0603
R008	45143	SMD Widerstand 68k 5% 0603	SMD resistor 68k 5% 0603
R009	45214	SMD Widerstand 5k6 5% 0603	SMD resistor 5k6 5% 0603
R010	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R011	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R012	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R013	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R014	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R015	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R016	45139	SMD Widerstand 15k 5% 0603	SMD resistor 15k 5% 0603
R017	45153	SMD Widerstand 10M 10% 0603	SMD resistor 10M 10% 0603
R018	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R019	45153	SMD Widerstand 10M 10% 0603	SMD resistor 10M 10% 0603
R020	45126	SMD Widerstand 100R 5% 0603	SMD resistor 100R 5% 0603
R021	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R022	45143	SMD Widerstand 68k 5% 0603	SMD resistor 68k 5% 0603
R023	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R024	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R025	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R026	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R027	45122	SMD Widerstand 22R 5% 0603	SMD resistor 22R 5% 0603
R028	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R029	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R030	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R031	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R032	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R033	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R034	45137	SMD Widerstand 6k8 5% 0603	SMD resistor 6k8 5% 0603
R035	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R036	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R037	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R038	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R039	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R040	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R041	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R042	45150	SMD Widerstand 1M 5% 0603	SMD resistor 1M 5% 0603
R043	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R044	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R045	45153	SMD Widerstand 10M 10% 0603	SMD resistor 10M 10% 0603
U001	41563	SMD IC MC33079D SO8	SMD IC MC33079D SO8
U002	45093	SMD IC NE572D SOL16	SMD IC NE572D SOL16
U003	41277	SMD IC MC33078D SO8	SMD IC MC33078D SO8
U004	41277	SMD IC MC33078D SO8	SMD IC MC33078D SO8

18 ANZEIGE-MODUL A006

18.1 BESCHREIBUNG

Das Anzeige-Modul ist auf einer vierlagigen Platine mit den Maßen 141 x 34,5 mm und einseitiger Bauteilbestückung aufgebaut.

Es benötigt als Betriebsspannungen 5 VDC und 8 VDC/120 mA. Die 8 V Betriebsspannung wird für die Hintergrundbeleuchtung des LCD benötigt, wobei diese mittels eines Steuersignals ein- bzw. ausgeschaltet wird. Die Signale und die Betriebsspannungen werden dem Anzeige-Modul über eine 12-polige Buchse zugeführt, die mit ca. 40 mm Leitungsanschluß direkt auf die Platine gelötet wird.

Die Ansteuerung des Anzeige-Moduls erfolgt mittels eines Vierdrahtbus über den LCD-Controller µPD7225, der dann die Ansteuerung der LCD-Anzeige übernimmt. Die LCD-Anzeige ist eine 3-fach COMMON-Backplane-Anzeige mit 93 Einzelsegmenten. Die 31 Segmentleitungen (31 Seg x 3 COM = 93 Elemente) werden vom Controller im 3-fach-Multiplex mit 3-Level-Bias angesteuert.

Auf dem Anzeige-Modul befinden sich drei Taster, die im Empfänger die Funktionen "UP", "DOWN" und "SET" wahrnehmen.

Stift	Signal	Verwendung	Art	Dir	Baugruppe
P01	5 V	VCC	Power	IN	alle
P02	+ 8 V	+ 8 V	Power	IN	Backlight
P03	GND	GND	Power	IN	alle
P04	/RESET	/RESET	digital	IN	µPD7225
P05	LCD_SCLK	LCD_SCLK	digital	IN	µPD7225
P06	LCD_SDAT	LCD_SDAT	digital	IN	µPD722
P07	/LCD_CS	/LCD_CS	digital	IN	µPD7225
P08	/LCD_BUSY	/LCD_BUSY	digital	OUT	µPD7225
P09	LIGHT	LIGHT	digital	IN	Backlight
P10	/TA_UP	/TA_UP	digital	OUT	Taster
P11	/TA_DOWN	/TA_DOWN	digital	OUT	Taster
P12	/TA_SEL	/TA_SEL	digital	OUT	Taster

NOTIZEN:

18 DISPLAY ASSEMBLY A006

18.1 DESCRIPTION

The display assembly is configured on a four-layer PCB of 141 x 34.5 mm.

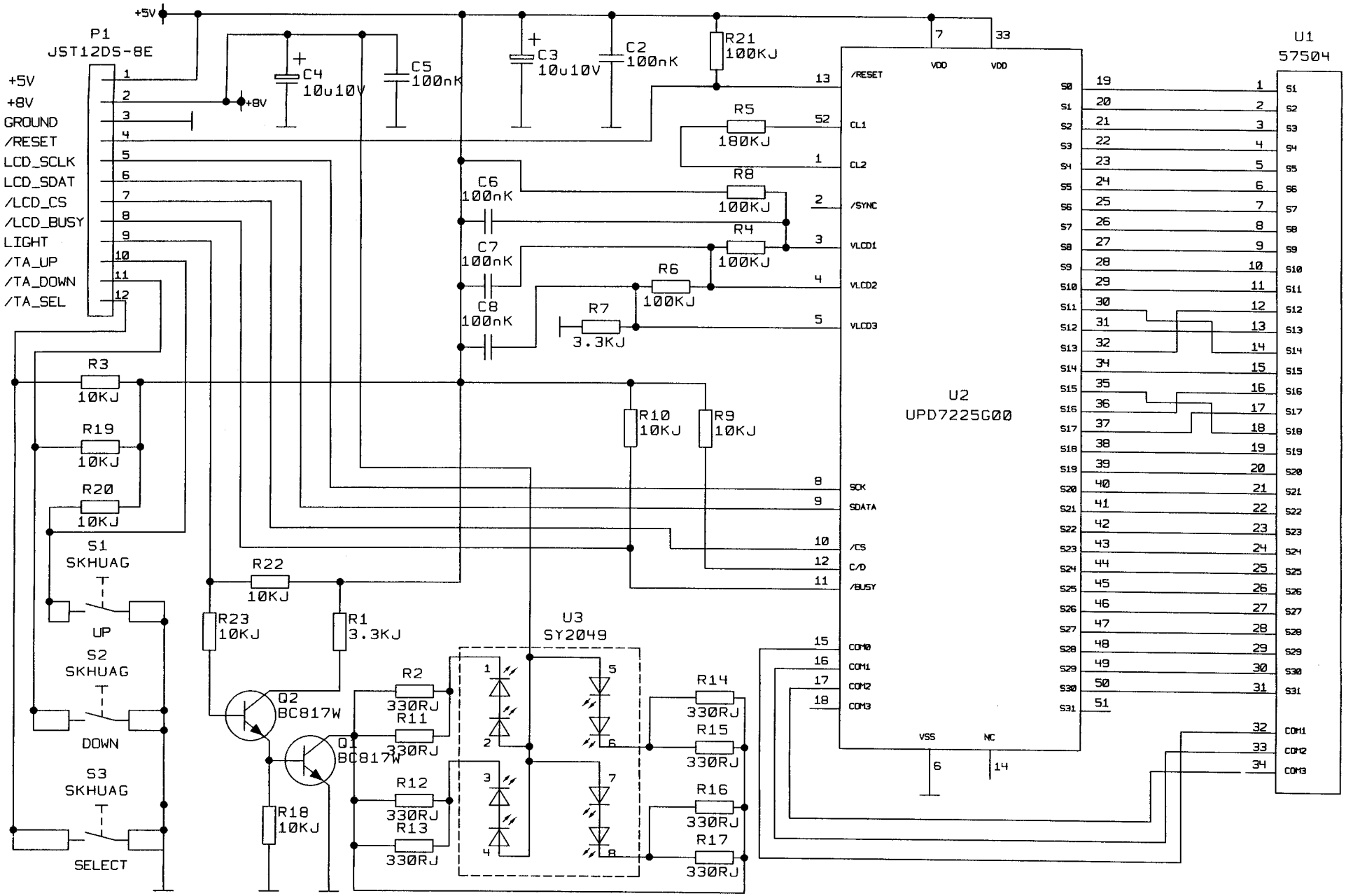
The assembly requires operating voltages of 5 VDC and 8 VDC/ 120 mA. The 8 V operating voltage is needed for backlighting the LCD display. The backlighting is switched on and off by a control signal. The signals and operating voltages are fed to the display assembly via a 12-pin socket which is directly soldered to the PCB with a connection wire of approx. 40 mm.

The display assembly is addressed by means of a four-bit bus via the LCD controller µPD7225, which then takes over the addressing of the LCD display. The LCD display is a 3-fold COMMON backplane display with 93 individual segments. The 31 segments (31 Seg x 3 COM = 93 elements) are addressed by the controller in 3-fold multiplex with 3-level bias.

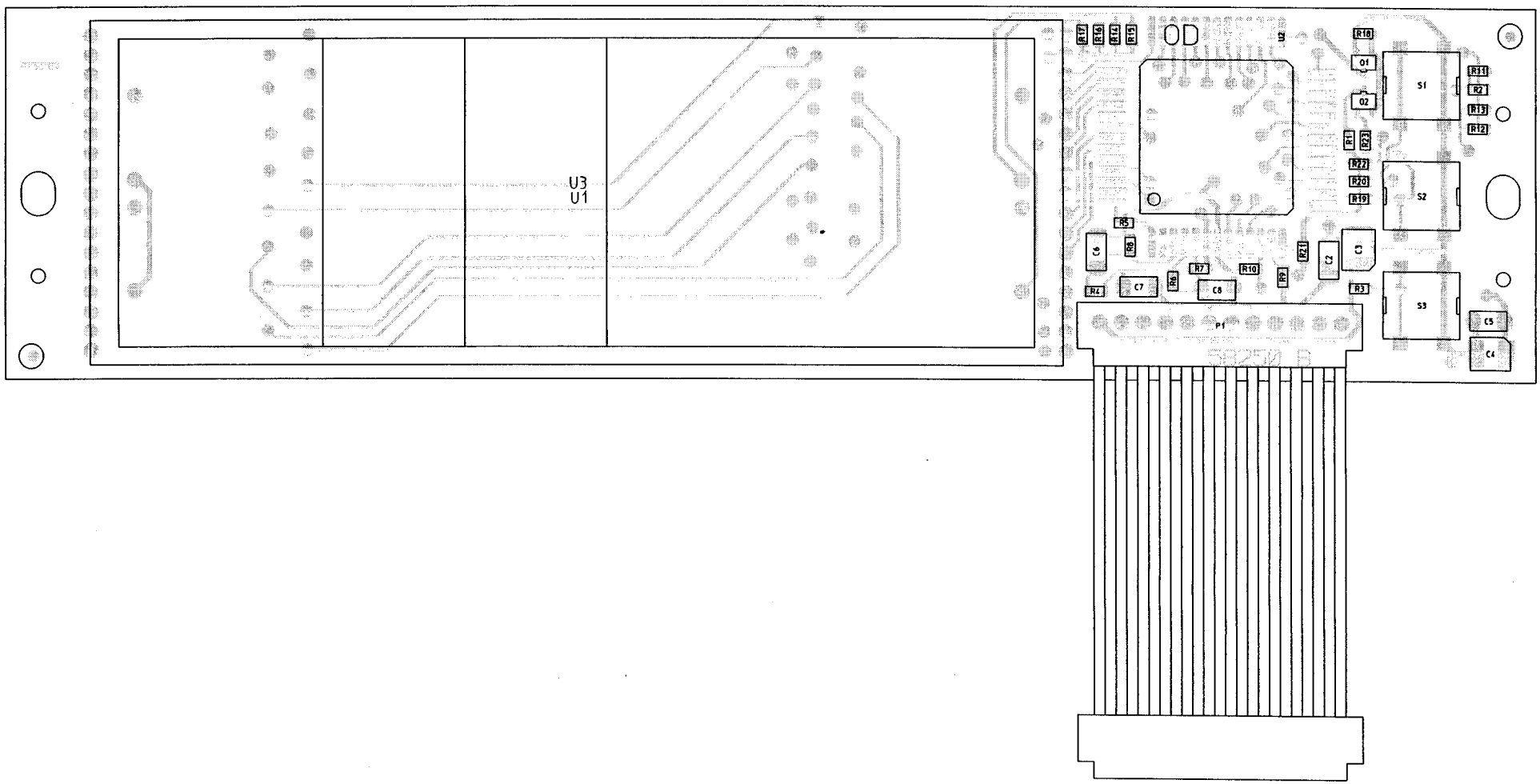
The display assembly has three buttons for the receiver functions UP, DOWN and SET.

Pin	Signal	Use	Type	Dir.	Component
P01	5 V	VCC	Power	IN	All
P02	+ 8 V	+ 8 V	Power	IN	Backlight
P03	GND	GND	Power	IN	All
P04	/RESET	/RESET	Digital	IN	µPD7225
P05	LCD_SCLK	LCD_SCLK	Digital	IN	µPD7225
P06	LCD_SDAT	LCD_SDAT	Digital	IN	µPD722
P07	/LCD_CS	/LCD_CS	Digital	IN	µPD7225
P08	/LCD_BUSY	/LCD_BUSY	Digital	OUT	µPD7225
P09	LIGHT	LIGHT	Digital	IN	Backlight
P10	/TA_UP	/TA_UP	Digital	OUT	Push button
P11	/TA_DOWN	/TA_DOWN	Digital	OUT	Push button
P12	/TA_SEL	/TA_SEL	Digital	OUT	Push button

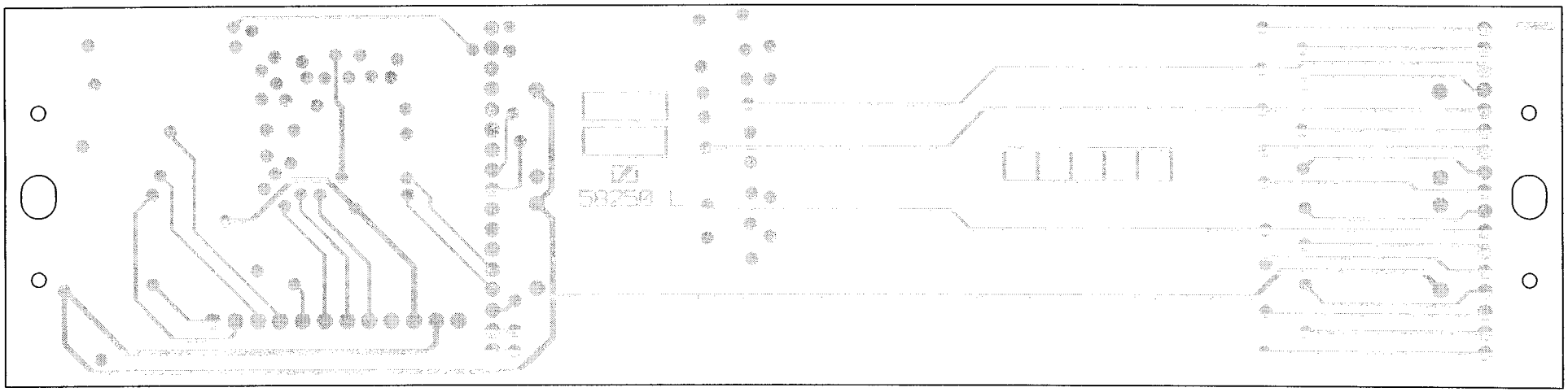
NOTES:



ANZEIGE-MODUL A006, STROMLAUFPLAN
DISPLAY ASSEMBLY A006, CIRCUIT DIAGRAM



ANZEIGE-MODUL A006, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
DISPLAY ASSEMBLY A006, PRINTED CIRCUIT BOARD, COMPONENT SIDE



ANZEIGE-MODUL A006, GEDRUCKTE SCHALTUNG, LÖTSEITE
DISPLAY ASSEMBLY A006, PRINTED CIRCUIT BOARD, SOLDER SIDE

18.4 ERSATZTEILE

18.4 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
S001	45797	SMD Taster	SMD switch
S002	45797	SMD Taster	SMD switch
S003	45797	SMD Taster	SMD switch
U001	57504	LC-Display	LC display

19 DC/DC WANDLER-MODUL A007

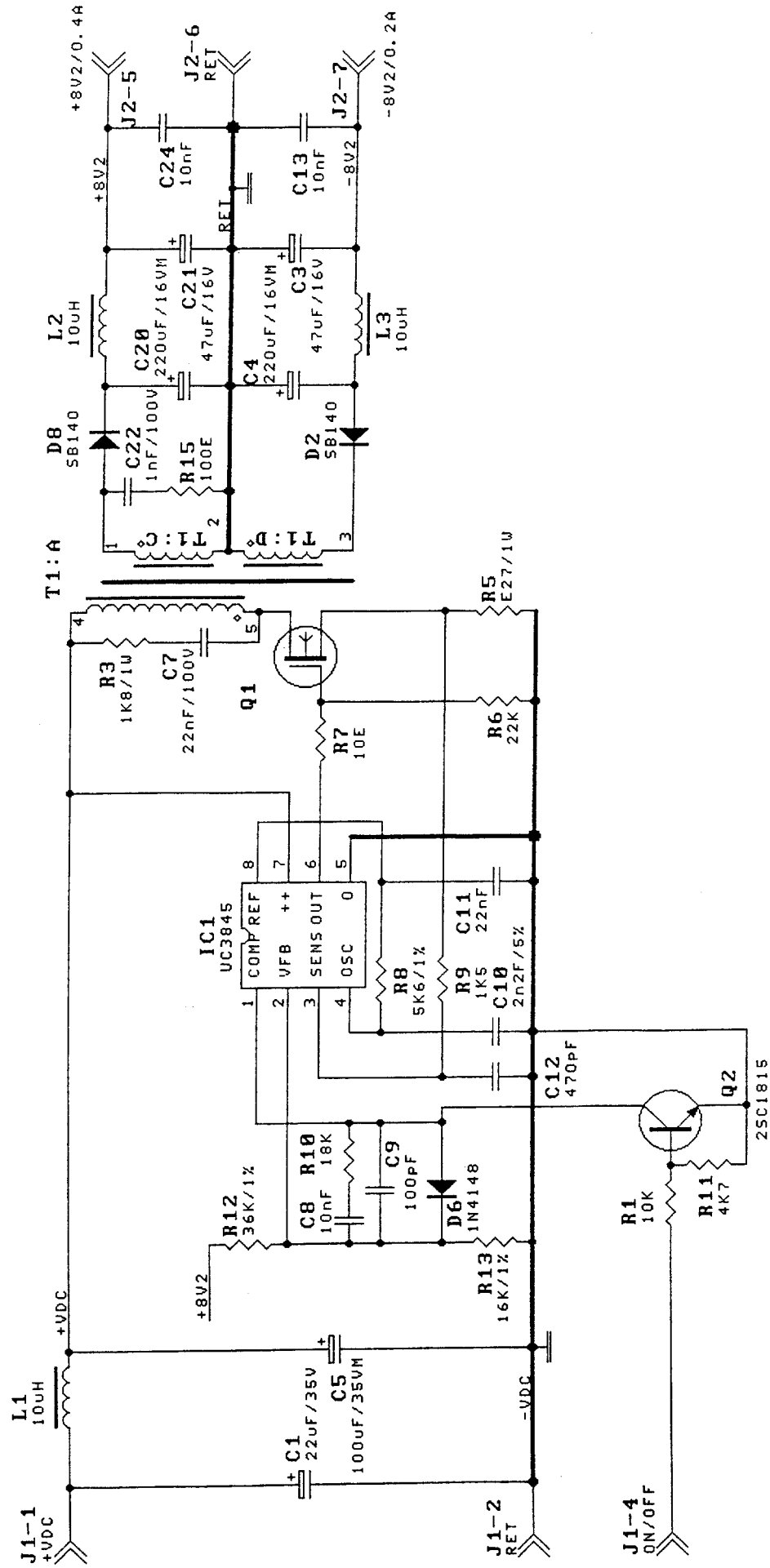
19 DC/DC CONVERTER ASSEMBLY A007

1. Eingangsspannungsbereich / Input voltage	: 10V-18V DC	
2. 35V Spitze für max 0,5 sec / 35V peak for max. 0,5 s		
3. Einschaltstrom / Inrush current	: nicht definiert / not spezified	
4. Wirkungsgrad /Efficiency	: ≥75% / 10V-18V und Nennstrom / nominal load cond.	
5. Arb.Temperaturbereich / Operating temperatur	: -10°C - +60°C	
6. Lagertemperaturbereich / Storage temperatur	: -25°C - +85°C	
7. Feuchte Arbeitsbereich / Humidity operating	: 8% - 80%	
8. Feuchte Lagerbereich / Humidity storage	: 5% - 95%	
9. Kühlung über Konvektion / Free air convection cooling		
10. Kalk. M.T.B.F. / Calc. M.T.B.F. figure	: 45°C > 100000 Std	
11. Keine galv. Trennung / No galvanic isolation		
12. Ausgang / Output	1	2
a. Nennspannung / Nominal voltage	+8,2V DC	-8,2V DC
b. Toleranz / Tolerance	±1,5%	±5%
c. Min Strom / Minimum current	0,1A	0,05A
d. Nennstrom / Nominal current	0,4A	0,1A
e. Spg Regul. / Line regulation Bed. wie 1. / specs. conf. 1.	±0,2%	±0,2%
f. Cross reg. Bed. wie c. d. / specs. conf. c. d.	±1,5%	±5%
g. Störspannung / Ripple & noise	≤100mVSS / 100mVp.p (100MHz Bandbreite) (100Mhz bandwidth)	≤100mVSS / 100mVp.p (100MHz Bandbreite) (100Mhz bandwidth)
h. Überschwingen / Overshoot *	≤0,2V	≤0,2V
i. Reaktionszeit / Response time *	≤2ms	≤2ms

* Lastsprung von 50% auf 100% v. Nennwert
load change 50% to 100% from nominal value

NOTIZEN:

NOTES:



DC/DC-WANDLER-MODUL A007, STROMLAUFPLAN
DC/DC CONVERTER ASSEMBLY A007, CIRCUIT DIAGRAM

20 VHF TUNER-MODUL A012

20.1 ALLGEMEINES

Das Tunermodul ist auf einer Leiterplatte von 142 x 72 mm realisiert und wird an drei Punkten mit einer Grundplatte verschraubt. Zur Abschirmung der HF-Baugruppen wird ein Mehrkammerprofil mit 17,5 mm Höhe in entsprechende Schlitze der Platine eingelötet. Ein Blechdeckel ergänzt die Abschirmung. Die Schaltung ist auf einer zweiseitigen Platine mit einer Dicke von 1,5 mm aufgebaut, wobei die Unterseite eine fast vollständig geschlossene Massefläche darstellt. Die elektrische Verbindung zur Grundplatine geschieht über einen 16-poligen Steckverbinder während die beiden HF-Anschlüsse als SMD-Koaxbuchsen Typ MMS auf der Oberseite der LP ausgeführt sind.

20.2 SCHALTUNGSBESCHREIBUNG

Das Tunermodul enthält zwei gleiche HF-Teile für den Antenneneingang A und B und einen gemeinsamen Oszillator zur Umsetzung auf die Zwischenfrequenz von 10,7 MHz. Über die Antennenbuchse J1 wird die Empfangsspannung über den Eingangskreis L4, C3 und C4 auf die Basis des HF-Verstärkers Q2 gegeben. Dieser verstärkt das Eingangssignal um 10 dB. Dem Transistor folgt das Zwischenkreisbandfilter L5, C15, C16, L6, C19, C20, L7, C23, C24. Über das 3 dB-Pad (R9 - R11) gelangt das HF-Signal auf den Mischer U1. Mit Hilfe des Oszillators wird hier die Zwischenfrequenz von 10,7 MHz gebildet. Diese wird mit den Transistoren Q4 und Q5 verstärkt. Zwischen den beiden Transistoren ist das erste keramische ZF-Filter angeordnet. Vom Ausgang des Transistors Q5 gelangt die verstärkte ZF-Spannung auf das ZF-Modul, welches dann die weitere Verstärkung, Filterung, Begrenzung und Demodulation des Signals übernimmt.

20.3 OSZILLATORFREQUENZ

Der Oszillator Q204 schwingt 10,70 MHz unterhalb der Empfangsfrequenz. Der Buffer Q206 sorgt für gute Entkopplung zwischen Oszillator und Mischer U1 und U101. Vom Bufferausgang wird auch der Frequenzteiler 1 : 128/129 über die RC-Glieder R233, R234, C233 - C235 angesteuert. Die PLL-Schaltung U201 wird von einer externen Prozessorschaltung gesteuert. Der 4 MHz Quarzoszillator besteht aus der Transistorstufe Q208. Das passive Loopfilter steuert die Nachstimmdioden D200 und D201 des freilaufenden Oszillators Q204.

Die Betriebsspannung des Tuner-Moduls beträgt 8VDC. Die benötigten 5 VDC für PLL-Schaltung und Frequenzteiler werden mit dem Spannungsregler U204 erzeugt.

NOTIZEN:

20 VHF TUNER ASSEMBLY A012

20.1 GENERAL

The tuner assembly is mounted on a PCB of 142 x 72 mm and fixed to the PCB with screws at three points. For shielding of the RF circuits, a multichamber profile with a height of 17.5 mm is soldered to the respective slots of the PCB. The shielding is completed by a sheet metal cover. The circuit is implemented on a double-sided PCB with a thickness of 1.5 mm with the bottom surface representing an almost completely closed mass area. Electrical connection to the motherboard is realised via 16-pin plug-in connector, whereas the two RF connections are realised as MMS type SMD coaxial jacks on the top surface of the PCB.

20.2 DESCRIPTION

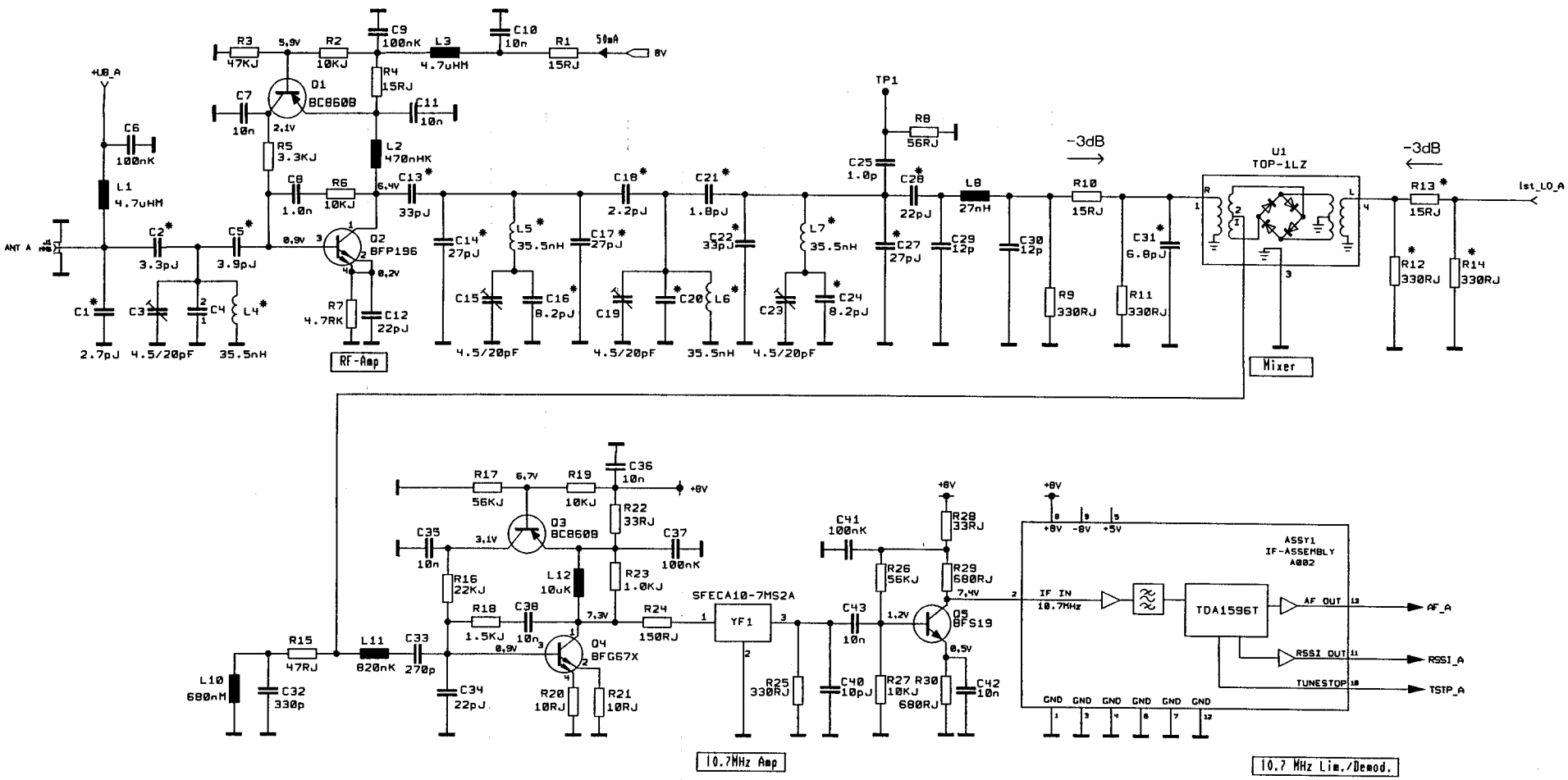
The tuner assembly contains two identical RF sections for the antenna inputs A and B and one common oscillator for generating the intermediate frequency of 10.7 MHz. The receiver voltage is fed to the base of the RF amplifier Q2 via the J1 antenna socket and the input circuits L4, C3, and C4. The RF amplifier Q2 amplifies the input signal by 10 dB. The transistor is followed by the IF band pass filters L5, C15, C16, L6, C19, C20, L7, C23, and C24. The RF signal is transmitted to the U1 mixer via the 3 dB pad (R9-R11). Here, the intermediate frequency of 10.7 MHz is generated by the oscillator. This IF is amplified by the Q4 and Q5 transistors. The first ceramic IF filter is installed between the two transistors. The amplified IF voltage is fed to the IF assembly via the output of the Q5 transistor. The IF assembly then amplifies, filters, limits, and demodulates the signal.

20.3 OSCILLATOR FREQUENCY

The Q204 oscillator oscillates at 10.7 MHz below the receiving frequency. The Q206 buffer ensures safe decoupling of the oscillator and the U1 and U101 mixers. The buffer output triggers the prescaler 1 : 128/129 via the RC circuits R233, R234, and C233-235. The PLL circuit U201 is controlled by an external processor circuit. The 4 MHz crystal oscillator consists of the Q208 transistor stage. The passive loop filter controls the D200 and D201 frequency trimming diodes of the Q204 free-running oscillator.

The operating voltage of the tuner assembly is 8 VDC. The 5 VDC required for the PLL circuit and the prescaler are generated by the U204 voltage regulator.

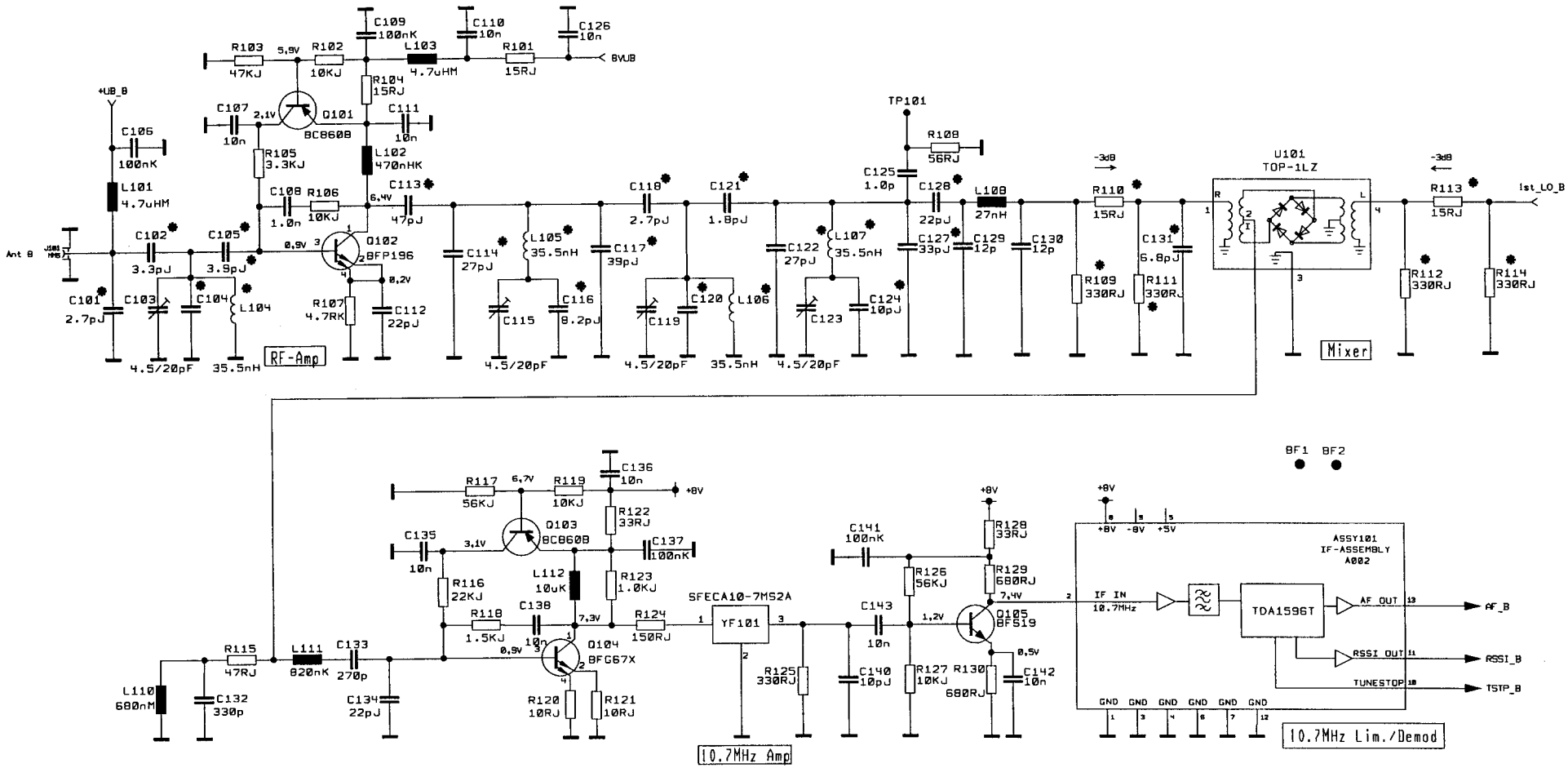
NOTES:



* Components shown range 3

	Range	RF-Amplifier																						
No.	Freq. MHz	C1	C2	L4	C4	C5	C13	C14	L5	C16	C17	C18	C20	C21	L6	C22	L7	C24	C27	C28	C31	R12	R13	R14
1	138-155	2p7	3p9	43n	10p	4p7	47p	39p	43n	15p	39p	5p6	6p8	3p3	43n	39p	43n	15p	39p	22p	6p8	-	0R	-
2	148-181	2p7	3p9	43n	-	4p7	56p	33p	43n	12p	39p	4p7	5p6	2p2	35n5	27p	43n	15p	33p	22p	6p8	330	15	330
3	174-223	2p7	3p3	35n5	-	3p9	33p	27p	35n5	8p2	27p	2p2	-	1p8	35n5	33p	35n5	8p2	27p	22p	6p8	330	15	330
4	216-260	6p8	3p3	22n	-	3p9	100p	22p	35n5	-	22p	2p2	-	1p8	22n	22p	35n5	-	27p	15p	4p7	330	15	330

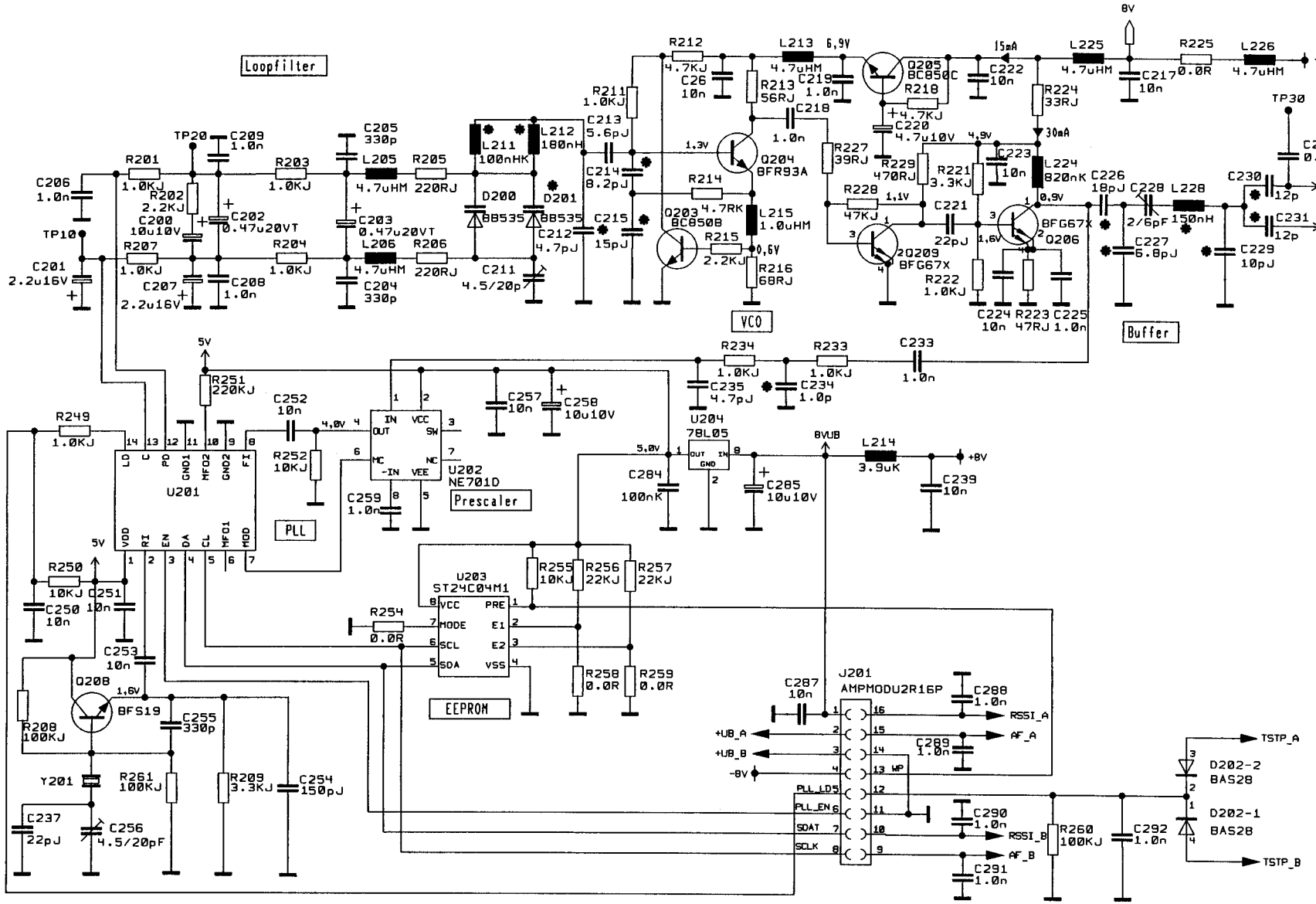
VHF TUNER-MODUL A012, A-KANAL, STROMLAUFPLAN
VHF TUNER ASSEMBLY A012, A CHANNEL, CIRCUIT DIAGRAM



* Components of Range

Range		RF-Amplifier																						
No.	Freq. MHz	C101	C102	L104	C104	C105	C113	C114	L105	C116	C117	C118	C120	C121	L106	C122	L107	C124	C127	C128	C131	R109	R110	R111	R112	R113	R114
1	138-155	2p7	3p9	43n	10p	4p7	47p	39p	43n	15p	39p	5p6	6p8	3p3	43n	39p	43n	15p	39p	22p	6p8	330	15	330	-	0R	-
2	148-181	2p7	3p9	43n	-	4p7	56p	33p	43n	12p	39p	4p7	5p6	2p2	35n5	33p	43n	15p	27p	27p	6p8	180	33	180	330	15	330
3	174-223	2p7	3p3	35n5	-	3p9	47p	27p	35n5	8p2	39p	2p7	-	1p8	35n5	27p	35n5	10p	33p	22p	6p8	330	15	330	330	15	330
4	216-260	6p8	2p7	22n	-	3p9	100p	22p	35n5	-	22p	2p2	-	1p8	22n	22p	35n5	-	27p	15p	4p7	330	15	330	330	15	330

VHF TUNER-MODUL A012, B-KANAL, STROMLAUFPLAN
VHF TUNER ASSEMBLY A012, B CHANNEL, CIRCUIT DIAGRAM

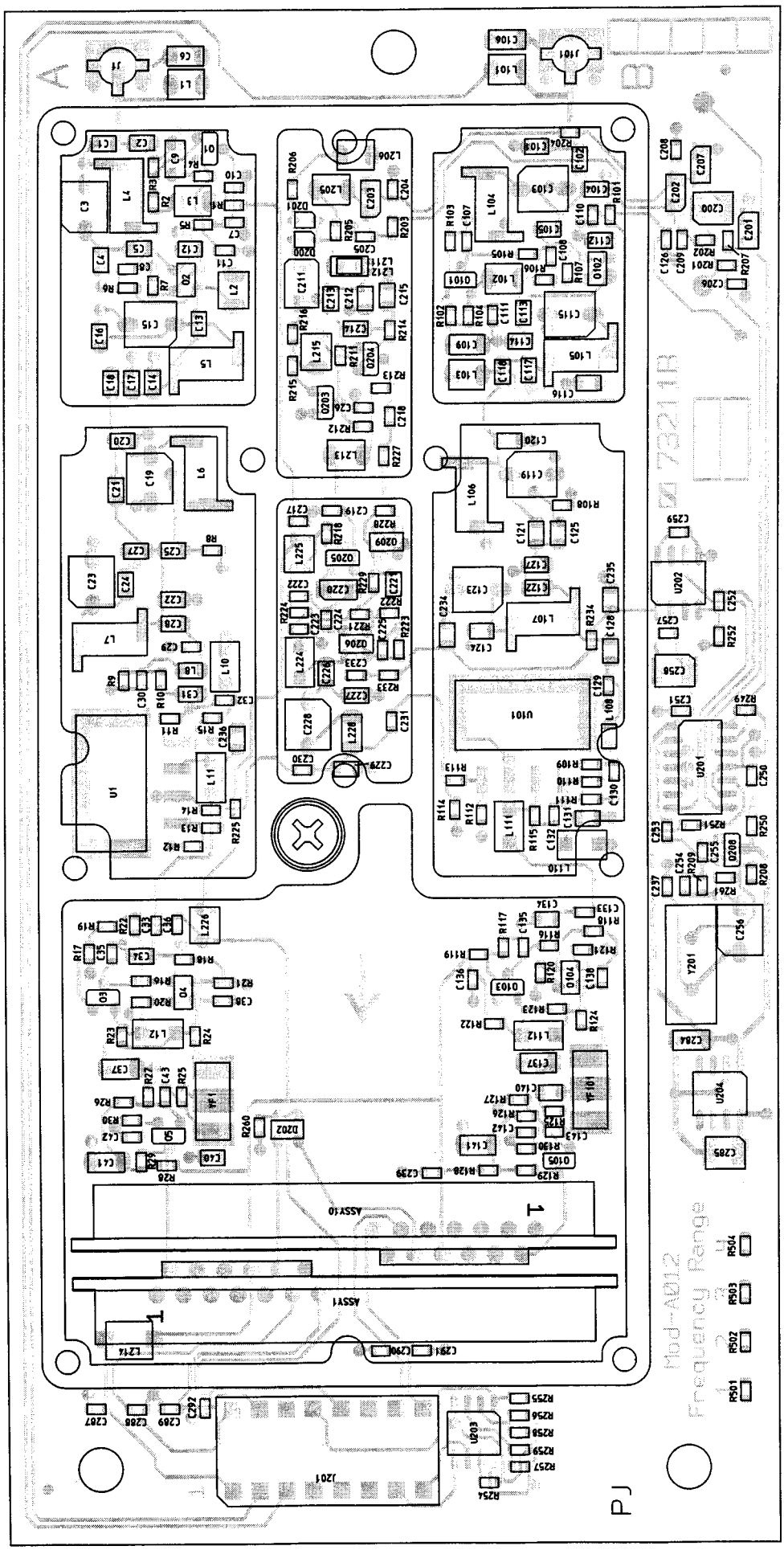


* Components shown range 3

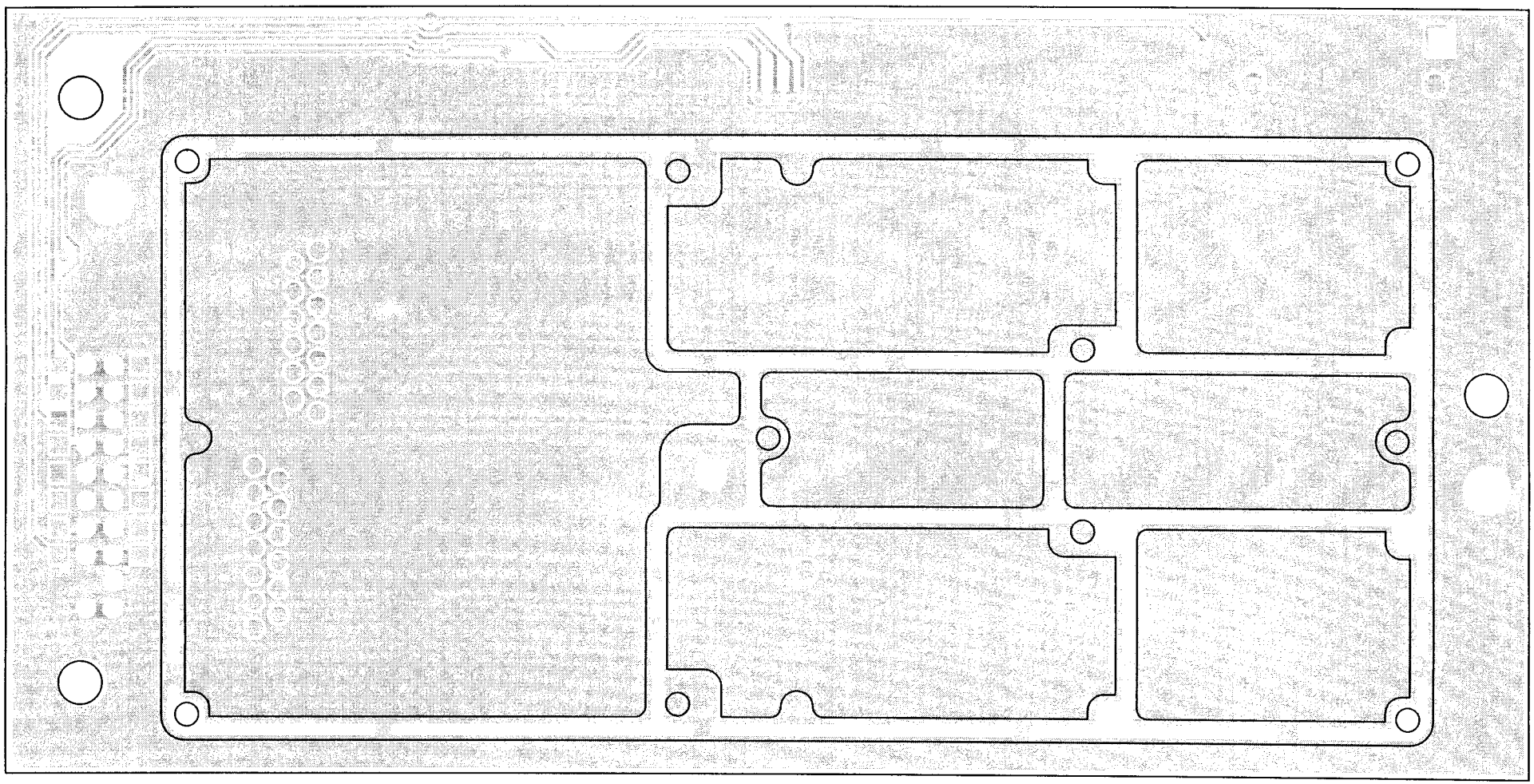
Range		VCO							BUFFER							CODE-RESISTOR			
No.	Freq. MHz	L211	L212	D201	C212	C213	C214	C215	C226	C227	C229	C230	C231	C234	L228	R501	R502	R503	R504
1	138-155	330n	--	BB535	4p7	5p6	33p	22p	10p	10p	15p	18p	18p	2p2	220n	1.0k	--	--	--
2	148-181	330n	--	--	4p7	5p6	15p	22p	18p	5p6	12p	12p	12p	2p2	220n	--	1.0k	--	--
3	174-223	--	180n	BB535	4p7	5p6	8p2	15p	18p	6p8	10p	12p	12p	1p0	150n	--	--	1.0k	--
4	216-260	100n	--	BB535	5p6	5p6	8p2	15p	18p	6p8	15p	18p	18p	1p0	100n	--	--	--	1.0k

R501 1.0KJ
R502 1.0KJ
R503 1.0KJ
R504 1.0KJ

VHF TUNER-MODUL A012, OSZILLATOR, STROMLAUFPLAN
VHF TUNER ASSEMBLY A012, OSCILLATOR, CIRCUIT DIAGRAM



VHF TUNER-MODUL A012, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
VHF TUNER ASSEMBLY A012, PRINTED CIRCUIT BOARD, COMPONENT SIDE



VHF TUNER-MODUL A012, GEDRUCKTE SCHALTUNG, LÖTSEITE
VHF TUNER ASSEMBLY A012, PRINTED CIRCUIT BOARD, SOLDER SIDE

PIN No.	Signal	in out	Level	Ri
1	+ 8V	in		
2	+ 12 - 18V max. 100 min. 60 mA	out		
3	+ 12 - 18V max. 100 min. 60 mA	out		
4	- 8V	NC		
5	PLL-LD	out		
6	PLL-EN	in		
7	SDAT	in out		
8	SCLK	in		
9	AF out B	out	6 dBu max	≤200R
10	RSSI B	out	≤0,5...+5V	≤6k
11	GND ⏚	in		
12	TSTP	out	hi +5V low 0V	≤6k
13	WP	in		
14	GND ⏚	in		
15	AF out A	out	6 dBu max.	≤200R
16	RSSI A	out	≤0,5...+5V	≤6k

VHF TUNER-MODUL A012, PINBELEGUNG
VHF TUNER ASSEMBLY A012, PIN ASSIGNMENTS

characteristics	datas
Dimensions	143x72x20mm
Weight	178g
Connetor between tuner assembly and main PCB	16-pin connectors pin spacing: 2x2.54mm and 2.54mm
Antenna inputs	2MMS-jack
Antenna input impedance	50Ω
Frequency range	138-260MHz
Receiver frequencies	max. 32 in 4 groups
Switching bandwith	≤ 7MHz
Frequency stability	±20ppm (-10°C to 55°C)
local oscillator	Lo= fr - 10.7MHz
Input limiting-3dB	≤ 1µV
Sensitivity S/N-26dB (A) (at nominal deviation)	≤ 1µV
Max.sensitivity (at peak deviation)	≥ 76dB (A)
RSSI voltage	≤ 0.5-4V
Image rejection	≥ 60dB, typ. 65dB
AM rejection 60% AM	≥ 46dB
Adjacent channel rejection	≥ 75dB
Intermodulation attenuation	≥ 70dB
Free field interference radiation 30-2000MHz	≥ -57dBm (2nW)
Modulation	wideband FM
Nominal / peak deviation	±40kHz / ±56kHz
timeconstant	50 µs
AF-frequency response	5Hz-20kHz
AF-output at nominal deviation	0.775V
THD at 1kHz and nominal deviation	≤ 0.5%
Temperature range	-10°C - +55°C
Power supply	8V DC
Current consumption	235mA

VHF TUNER-MODUL A012, TECHNISCHE DATEN
VHF TUNER ASSEMBLY A012, TECHNICAL DATA

20.8 ERSATZTEILE

20.8 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	75533	**Tuner-Modul A012 (138-155MHz)**	**Tuner assembly A012 (138-155MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C001	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C002	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C003	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C004	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C005	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C008	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C009	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C010	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C011	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C012	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C013	19509	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C014	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C015	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C016	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C017	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C018	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C019	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C020	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C021	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C022	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C023	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C024	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C025	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C026	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C027	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C028	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C029	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C030	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C031	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C032	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C033	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C034	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C035	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C036	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C037	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C038	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C040	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C041	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C042	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C043	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C101	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C102	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C103	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C104	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C105	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C108	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C109	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C110	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C111	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C112	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C113	19509	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C114	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C115	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C116	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C117	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C118	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C119	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C120	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C121	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C122	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C123	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C124	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C125	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C126	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C127	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C128	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C129	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C130	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C131	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C132	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C133	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C134	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C135	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C136	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C137	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C138	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C140	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C141	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C142	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C143	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C205	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45875	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C212	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C213	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C214	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C215	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C217	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C227	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C228	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C229	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C230	45177	SMD Kondensator KERKO 18pF 50V NPO	SMD capacitor KERKO 18pF 50V NPO
C231	45177	SMD Kondensator KERKO 18pF 50V NPO	SMD capacitor KERKO 18pF 50V NPO
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C235	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C236	34523	SMD Kondensator KERKO 47pF 50V NP0 0805	SMD capacitor KERKO 47pF 50V NP0 0805
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D200	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	32123	SMD Spule 4,7uH	SMD coil 4.7uH

POS	IDENT	BEZEICHNUNG	DESCRIPTION
L002	46559	SMD Spule 470nH	SMD coil 470nH
L003	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L004	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L005	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L006	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L007	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L008	45385	SMD Spule 27nH	SMD coil 27nH
L010	45682	SMD Spule 680nH	SMD coil 680nH
L011	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L012	45683	SMD Spule 10uH	SMD coil 10uH
L101	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L102	46559	SMD Spule 470nH	SMD coil 470nH
L103	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L104	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L105	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L106	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L107	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L108	45385	SMD Spule 27nH	SMD coil 27nH
L110	45682	SMD Spule 680nH	SMD coil 680nH
L111	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L112	45683	SMD Spule 10uH	SMD coil 10uH
L205	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L206	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L211	41624	SMD Spule 330nH	SMD coil 330nH
L213	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L214	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L215	37191	SMD Spule 1uH	SMD coil 1uH
L224	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L225	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L226	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L228	37358	SMD Spule 220nH	SMD coil 220nH
Q001	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q002	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q003	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q004	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q005	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q101	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q102	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q103	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q104	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q105	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R002	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R003	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R004	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R005	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R006	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R007	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R008	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R009	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R010	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R011	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R013	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R015	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R016	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R017	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R018	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R019	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R020	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R021	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R022	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R023	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R024	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R025	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R026	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R027	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R028	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R029	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R030	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R101	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R102	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R103	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R104	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R105	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R106	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R107	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R108	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R109	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R110	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R111	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R113	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R115	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R116	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R117	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R118	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R119	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R120	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R121	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R122	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R123	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R124	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R125	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R126	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R127	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R128	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R129	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R130	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R206	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R214	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R218	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R225	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R234	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R261	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R501	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
U001	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U101	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y201	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
YF001	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
YF101	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	75534	**Tuner-Modul A012 (148-181MHz)**	**Tuner assembly A012 (148-181MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C001	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C002	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C003	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C005	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C008	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C009	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C010	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C011	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C012	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C013	29145	SMD Kondensator KERKO 56pF 50V NP0 0805	SMD capacitor KERKO 56pF 50V NP0 0805
C014	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C015	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C016	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C017	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C018	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C019	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C020	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C021	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C022	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C023	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C024	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C025	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NP0
C026	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C027	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C028	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C029	45175	SMD Kondensator KERKO 12pF 50V NP0	SMD capacitor KERKO 12pF 50V NP0
C030	45175	SMD Kondensator KERKO 12pF 50V NP0	SMD capacitor KERKO 12pF 50V NP0
C031	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C032	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C033	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C034	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C035	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C036	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C037	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C038	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C040	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C041	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C042	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C043	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C101	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C102	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C103	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C105	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C108	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C109	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C110	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C111	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C112	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C113	29145	SMD Kondensator KERKO 56pF 50V NP0 0805	SMD capacitor KERKO 56pF 50V NP0 0805
C114	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C115	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C116	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C117	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C118	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C119	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C120	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C121	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C122	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C123	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C124	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C125	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NP0
C126	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C127	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C128	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C129	45175	SMD Kondensator KERKO 12pF 50V NP0	SMD capacitor KERKO 12pF 50V NP0
C130	45175	SMD Kondensator KERKO 12pF 50V NP0	SMD capacitor KERKO 12pF 50V NP0
C131	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C132	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C133	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C134	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C135	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C136	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C137	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C138	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C140	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C141	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C142	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C143	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C205	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45875	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C212	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C213	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C214	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C215	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C217	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C227	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C228	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C229	29141	SMD Kondensator KERKO 12pF 50V NP0 0805	SMD capacitor KERKO 12pF 50V NP0 0805
C230	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C231	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C235	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C236	34523	SMD Kondensator KERKO 47pF 50V NP0 0805	SMD capacitor KERKO 47pF 50V NP0 0805
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D200	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L002	46559	SMD Spule 470nH	SMD coil 470nH
L003	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L004	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L005	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L006	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16

POS	IDENT	BEZEICHNUNG	DESCRIPTION
L007	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L008	45385	SMD Spule 27nH	SMD coil 27nH
L010	45682	SMD Spule 680nH	SMD coil 680nH
L011	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L012	45683	SMD Spule 10uH	SMD coil 10uH
L101	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L102	46559	SMD Spule 470nH	SMD coil 470nH
L103	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L104	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L105	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L106	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L107	45884	SMD Luftspule 43nH SUP16	SMD air core coil 43nH SUP16
L108	45385	SMD Spule 27nH	SMD coil 27nH
L110	45682	SMD Spule 680nH	SMD coil 680nH
L111	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L112	45683	SMD Spule 10uH	SMD coil 10uH
L205	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L206	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L211	41624	SMD Spule 330nH	SMD coil 330nH
L213	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L214	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L215	37191	SMD Spule 1uH	SMD coil 1uH
L224	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L225	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L226	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L228	37358	SMD Spule 220nH	SMD coil 220nH
Q001	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q002	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q003	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q004	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q005	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q101	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q102	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q103	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q104	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q105	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R002	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R003	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R004	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R005	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R006	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R007	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R008	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R009	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R010	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R011	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R012	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R013	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R014	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R015	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R016	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R017	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R018	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R019	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R020	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R021	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R022	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R023	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R024	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R025	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R026	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R027	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R028	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R029	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R030	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R101	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R102	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R103	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R104	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R105	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R106	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R107	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R108	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R109	45205	SMD Widerstand 180R 5% 0603	SMD resistor 180R 5% 0603
R110	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R111	45205	SMD Widerstand 180R 5% 0603	SMD resistor 180R 5% 0603
R112	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R113	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R114	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R115	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R116	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R117	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R118	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R119	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R120	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R121	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R122	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R123	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R124	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R125	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R126	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R127	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R128	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R129	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R130	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R206	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R214	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R218	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R225	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R234	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R261	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R502	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
U001	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U101	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y201	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
YF001	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
YF101	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	75535	**Tuner-Modul A012 (174-223MHz)**	**Tuner assembly A012 (174-223MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C001	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C002	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C003	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C005	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C008	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C009	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C010	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C011	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C012	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C013	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C014	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C015	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C016	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C017	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C018	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C019	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C021	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C022	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C023	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C024	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C025	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C026	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C027	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C028	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C029	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C030	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C031	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C032	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C033	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C034	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C035	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C036	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C037	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C038	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C040	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C041	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C042	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C043	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C101	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C102	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C103	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C105	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C108	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C109	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C110	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C111	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C112	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C113	19509	SMD Kondensator KERKO 47pF 50V NPO	SMD capacitor KERKO 47pF 50V NPO
C114	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C115	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C116	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C117	29144	SMD Kondensator KERKO 39pF 50V NP0	SMD capacitor KERKO 39pF 50V NP0
C118	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C119	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C121	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C122	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C123	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C124	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C125	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C126	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C127	28816	SMD Kondensator KERKO 33pF 50V NP0	SMD capacitor KERKO 33pF 50V NP0
C128	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C129	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C130	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C131	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C132	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C133	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C134	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C135	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C136	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C137	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C138	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C140	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C141	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C142	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C143	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C205	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45875	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C212	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C213	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C214	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C215	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C217	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C227	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C228	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C229	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C230	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C231	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C235	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C236	34523	SMD Kondensator KERKO 47pF 50V NP0 0805	SMD capacitor KERKO 47pF 50V NP0 0805
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D200	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L002	46559	SMD Spule 470nH	SMD coil 470nH
L003	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L004	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L005	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L006	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L007	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16

POS	IDENT	BEZEICHNUNG	DESCRIPTION
L008	45385	SMD Spule 27nH	SMD coil 27nH
L010	45682	SMD Spule 680nH	SMD coil 680nH
L011	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L012	45683	SMD Spule 10uH	SMD coil 10uH
L101	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L102	46559	SMD Spule 470nH	SMD coil 470nH
L103	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L104	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L105	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L106	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L107	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L108	45385	SMD Spule 27nH	SMD coil 27nH
L110	45682	SMD Spule 680nH	SMD coil 680nH
L111	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L112	45683	SMD Spule 10uH	SMD coil 10uH
L205	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L206	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L212	45395	SMD Spule 180nH	SMD coil 180nH
L213	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L214	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L215	37191	SMD Spule 1uH	SMD coil 1uH
L224	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L225	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L226	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L228	41344	SMD Spule 150uH	SMD coil 150uH
Q001	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q002	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q003	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q004	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q005	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q101	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q102	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q103	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q104	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q105	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R002	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R003	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R004	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R005	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R006	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R007	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R008	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R009	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R010	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R011	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R012	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R013	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R014	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R015	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R016	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R017	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R018	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R019	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R020	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R021	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R022	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R023	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R024	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R025	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R026	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R027	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R028	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R029	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R030	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R101	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R102	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R103	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R104	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R105	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R106	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R107	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R108	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R109	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R110	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R111	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R112	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R113	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R114	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R115	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R116	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R117	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R118	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R119	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R120	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R121	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R122	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R123	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R124	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R125	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R126	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R127	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R128	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R129	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R130	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R206	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R214	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R218	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R225	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R234	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R261	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R503	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
U001	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U101	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y201	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
YF001	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
YF101	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

POS	IDENT	BEZEICHNUNG	DESCRIPTION
	75536	**Tuner-Modul A012 (216-260MHz)**	**Tuner assembly A012 (216-260MHz)**
ASSY1	75104	ZF-Modul (A002)	IF assembly (A002)
ASSY2	75104	ZF-Modul (A002)	IF assembly (A002)
C001	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C002	28834	SMD Kondensator KERKO 3,3pF 50V NP0 0805	SMD capacitor KERKO 3.3pF 50V NP0 0805
C003	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C005	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C006	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C007	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C008	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C009	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C010	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C011	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C012	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C013	28692	SMD Kondensator KERKO 100pF 50V NP0 0805	SMD capacitor KERKO 100pF 50V NP0 0805
C014	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C015	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C017	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C018	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C019	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C021	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C022	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C023	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C025	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C026	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C027	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C028	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C029	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C030	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C031	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C032	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C033	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C034	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C035	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C036	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C037	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C038	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C040	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C041	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C042	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C043	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C101	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C102	29476	SMD Kondensator KERKO 2,7pF 50V NP0 0805	SMD capacitor KERKO 2.7pF 50V NP0 0805
C103	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C105	29140	SMD Kondensator KERKO 3,9pF 50V NP0 0805	SMD capacitor KERKO 3.9pF 50V NP0 0805
C106	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C107	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C108	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C109	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C110	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C111	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C112	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C113	28692	SMD Kondensator KERKO 100pF 50V NP0 0805	SMD capacitor KERKO 100pF 50V NP0 0805
C114	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C115	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C117	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C118	29011	SMD Kondensator KERKO 2,2pF 50V NP0	SMD capacitor KERKO 2.2pF 50V NP0
C119	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C121	29562	SMD Kondensator KERKO 1,8pF 50V NP0 0805	SMD capacitor KERKO 1.8pF 50V NP0 0805
C122	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C123	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C125	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C126	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C127	29111	SMD Kondensator KERKO 27pF 50V NP0 0805	SMD capacitor KERKO 27pF 50V NP0 0805
C128	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C129	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C130	45175	SMD Kondensator KERKO 12pF 50V NPO	SMD capacitor KERKO 12pF 50V NPO
C131	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C132	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C133	45246	SMD Kondensator KERKO 270pF 50V X7R	SMD capacitor KERKO 270pF 50V X7R
C134	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C135	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C136	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C137	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R

POS	IDENT	BEZEICHNUNG	DESCRIPTION
C138	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C140	19617	SMD Kondensator KERKO 10pF 50V NP0 0805	SMD capacitor KERKO 10pF 50V NP0 0805
C141	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C142	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C143	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C200	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C201	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C202	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C203	45050	SMD Kondensator TA-KO 470nF 20V	SMD capacitor TA-KO 470nF 20V
C204	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C205	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C206	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C207	45043	SMD Kondensator TA-KO 2,2uF 16V	SMD capacitor TA-KO 2.2uF 16V
C208	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C209	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C211	45875	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C212	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C213	29402	SMD Kondensator KERKO 5,6pF 50V NP0 0805	SMD capacitor KERKO 5.6pF 50V NP0 0805
C214	29565	SMD Kondensator KERKO 8,2pF 50V NP0 0805	SMD capacitor KERKO 8.2pF 50V NP0 0805
C215	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C217	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C218	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C219	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C220	48319	SMD Kondensator TA-KO 4,7uF 10V	SMD capacitor TA-KO 4.7uF 10V
C221	19584	SMD Kondensator KERKO 22pF 50V NP0 0805	SMD capacitor KERKO 22pF 50V NP0 0805
C222	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C223	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C224	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C225	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C226	29143	SMD Kondensator KERKO 18pF 50V NP0 0805	SMD capacitor KERKO 18pF 50V NP0 0805
C227	29248	SMD Kondensator KERKO 6,8pF 50V NP0 0805	SMD capacitor KERKO 6.8pF 50V NP0 0805
C228	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C229	29142	SMD Kondensator KERKO 15pF 50V NP0 0805	SMD capacitor KERKO 15pF 50V NP0 0805
C230	45177	SMD Kondensator KERKO 18pF 50V NPO	SMD capacitor KERKO 18pF 50V NPO
C231	45177	SMD Kondensator KERKO 18pF 50V NPO	SMD capacitor KERKO 18pF 50V NPO
C233	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C234	29014	SMD Kondensator KERKO 1pF 50V NP0	SMD capacitor KERKO 1pF 50V NPO
C235	17941	SMD Kondensator KERKO 4,7pF 50V NP0 0805	SMD capacitor KERKO 4.7pF 50V NP0 0805
C236	34523	SMD Kondensator KERKO 47pF 50V NP0 0805	SMD capacitor KERKO 47pF 50V NP0 0805
C237	45178	SMD Kondensator KERKO 22pF 50V NPO	SMD capacitor KERKO 22pF 50V NPO
C239	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C250	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C251	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C252	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C253	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C254	45188	SMD Kondensator KERKO 150pF 50V NPO	SMD capacitor KERKO 150pF 50V NPO
C255	45192	SMD Kondensator KERKO 270pF 50V 0603 X7R	SMD capacitor KERKO 270pF 50V 0603 X7R
C256	45363	SMD Trimmkondensator 4,5/20pF	SMD capacitor variable 4.5/20pF
C257	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C258	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C259	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C284	19480	SMD Kondensator KERKO 100nF 50V X7R	SMD capacitor KERKO 100nF 50V X7R
C285	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C287	45201	SMD Kondensator KERKO 10nF 50V X7R	SMD capacitor KERKO 10nF 50V X7R
C288	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C289	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C290	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C291	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
C292	45195	SMD Kondensator KERKO 1nF 50V X7R	SMD capacitor KERKO 1nF 50V X7R
D200	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D201	45840	SMD Diode Varicap BB535	SMD diode varicap BB535
D202	40101	SMD Doppeldiode BAS28 SOT143	SMD double diode BAS28 SOT143
J001	45811	SMD Buchse 50R	SMD socket 50R
J101	45811	SMD Buchse 50R	SMD socket 50R
J201	45817	Federleiste	Spring strip
L001	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L002	46559	SMD Spule 470nH	SMD coil 470nH
L003	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L004	45881	SMD Luftspule 22nH SUP16	SMD air core coil 22nH SUP16
L005	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L006	45881	SMD Luftspule 22nH SUP16	SMD air core coil 22nH SUP16
L007	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L008	45385	SMD Spule 27nH	SMD coil 27nH
L010	45682	SMD Spule 680nH	SMD coil 680nH
L011	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L012	45683	SMD Spule 10uH	SMD coil 10uH

POS	IDENT	BEZEICHNUNG	DESCRIPTION
L101	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L102	46559	SMD Spule 470nH	SMD coil 470nH
L103	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L104	45881	SMD Luftspule 22nH SUP16	SMD air core coil 22nH SUP16
L105	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L106	45881	SMD Luftspule 22nH SUP16	SMD air core coil 22nH SUP16
L107	45883	SMD Luftspule 35,5nH SUP16	SMD air core coil 35.5nH SUP16
L108	45385	SMD Spule 27nH	SMD coil 27nH
L110	45682	SMD Spule 680nH	SMD coil 680nH
L111	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L112	45683	SMD Spule 10uH	SMD coil 10uH
L205	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L206	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L211	40852	SMD Spule 100nH	SMD coil 100nH
L213	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L214	45563	SMD Spule 3,9uH	SMD coil 3.9uH
L215	37191	SMD Spule 1uH	SMD coil 1uH
L224	45886	SMD Spule 820nH SUP8	SMD coil 820nH SUP8
L225	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L226	32123	SMD Spule 4,7uH	SMD coil 4.7uH
L228	40852	SMD Spule 100nH	SMD coil 100nH
Q001	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q002	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q003	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q004	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q005	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q101	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q102	45721	SMD Transistor BFP196 SOT143	SMD transistor BFP196 SOT143
Q103	32468	SMD Transistor BC860B SOT23	SMD transistor BC860B SOT23
Q104	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q105	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q203	32467	SMD Transistor BC850B SOT23	SMD transistor BC850B SOT23
Q204	41278	SMD Transistor BFR93A SOT23	SMD transistor BFR93A SOT23
Q205	21165	SMD Transistor BC850C SOT23	SMD transistor BC850C SOT23
Q206	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
Q208	32881	SMD Transistor BFS19 SOT23	SMD transistor BFS19 SOT23
Q209	43663	SMD Transistor BFG67/X SOT143	SMD transistor BFG67/X SOT143
R001	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R002	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R003	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R004	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R005	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R006	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R007	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R008	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R009	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R010	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R011	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R012	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R013	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R014	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R015	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R016	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R017	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R018	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R019	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R020	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R021	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R022	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R023	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R024	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R025	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R026	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R027	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R028	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R029	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R030	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R101	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R102	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R103	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R104	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R105	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R106	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R107	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R108	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R109	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603

POS	IDENT	BEZEICHNUNG	DESCRIPTION
R110	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R111	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R112	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R113	45121	SMD Widerstand 15R 5% 0603	SMD resistor 15R 5% 0603
R114	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R115	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R116	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R117	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R118	45133	SMD Widerstand 1k5 5% 0603	SMD resistor 1k5 5% 0603
R119	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R120	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R121	45120	SMD Widerstand 10R 5% 0603	SMD resistor 10R 5% 0603
R122	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R123	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R124	45127	SMD Widerstand 150R 5% 0603	SMD resistor 150R 5% 0603
R125	45129	SMD Widerstand 330R 5% 0603	SMD resistor 330R 5% 0603
R126	45220	SMD Widerstand 56k 5% 0603	SMD resistor 56k 5% 0603
R127	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R128	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R129	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R130	45131	SMD Widerstand 680R 5% 0603	SMD resistor 680R 5% 0603
R201	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R202	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R203	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R204	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R205	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R206	45128	SMD Widerstand 220R 5% 0603	SMD resistor 220R 5% 0603
R207	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R208	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R209	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R211	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R212	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R213	45285	SMD Widerstand 56R 5% 0603	SMD resistor 56R 5% 0603
R214	45203	SMD Widerstand 4R7 10% 0603	SMD resistor 4R7 10% 0603
R215	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R216	45125	SMD Widerstand 68R 5% 0603	SMD resistor 68R 5% 0603
R218	45136	SMD Widerstand 4k7 5% 0603	SMD resistor 4k7 5% 0603
R221	45135	SMD Widerstand 3k3 5% 0603	SMD resistor 3k3 5% 0603
R222	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R223	45124	SMD Widerstand 47R 5% 0603	SMD resistor 47R 5% 0603
R224	45123	SMD Widerstand 33R 5% 0603	SMD resistor 33R 5% 0603
R225	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R227	45284	SMD Widerstand 39R 5% 0603	SMD resistor 39R 5% 0603
R228	45142	SMD Widerstand 47k 5% 0603	SMD resistor 47k 5% 0603
R229	45130	SMD Widerstand 470R 5% 0603	SMD resistor 470R 5% 0603
R233	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R234	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R249	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R250	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R251	45146	SMD Widerstand 220k 5% 0603	SMD resistor 220k 5% 0603
R252	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R254	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R255	45138	SMD Widerstand 10k 5% 0603	SMD resistor 10k 5% 0603
R256	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R257	45140	SMD Widerstand 22k 5% 0603	SMD resistor 22k 5% 0603
R260	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R261	45144	SMD Widerstand 100k 5% 0603	SMD resistor 100k 5% 0603
R504	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
U001	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U101	45879	SMD IC TOP.1LZ	SMD IC TOP.1LZ
U201	45711	SMD IC PLL CMOS TBB206G	SMD IC PLL CMOS TBB206G
U202	45508	SMD IC NE701D SO8	SMD IC NE701D SO8
U203	45812	SMD IC EEPROM 4K CMOS	SMD IC EEPROM 4K CMOS
U204	45709	SMD IC 78L05-0/70	SMD IC 78L05-0/70
Y201	45716	Quarz 4,000000MHz	Crystal 4.000000MHz
YF001	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz
YF101	45898	SMD Keramik-Filter 10,7MHz	SMD ceramic filter 10.7MHz

21 PROZESSOR-MODUL A014

21.1 BESCHREIBUNG

Das Prozessor-Modul ist auf einer vierlagigen Platine mit den Maßen 76,2 x 25 mm und doppelseitiger Bestückung aufgebaut. Die Signale und die Spannungsversorgung werden dem Modul über 49 versetzte Kontakte zugeführt.

Das Prozessor-Modul übernimmt die Steuerung des Empfängers und die Kommunikation mit angeschlossenen externen Geräten. Hierbei werden folgende Aufgaben wahrgenommen:

21.2 ANSTEUERUNG DER PLL

a) Einstellung der Betriebsparameter der PLL
b) Einstellung der Frequenz durch Einstellung der Teiler
c) Einlesen des PLL_LD Signals
d) Berechnen des Frequenzoffsets durch die ZF

21.3 ANSTEUERUNG DES LCD-MODULS

a) Ausgaben auf die LCD
b) Einlesen der Taster UP, DOWN und SET über das LCD-Modul

21.4 KOMMUNICATION MIT EXTERNEN GERÄTEN

a) RS232 Schnittstelle für PC-Konfigurationsprogramm
b) Prüf- und Testschnittstelle
c) RS485 Schnittstelle zum PC und Empfängern (S-MCD)
d) Baudratenerkennung

21.5 MESSUNG ANALOGER SYSTEMGRÖSSEN

a) Messung der RSSI-Spannungen und deren Auswertung bzw. Anzeige
b) Messung der Hub-Spannung des demodulierten Signals und deren Auswertung bzw. Anzeige
c) Dekodierung des LowBatt-Signals und dessen Anzeige

21.6 SPEICHERUNG UND VERWALTUNG SYSTEM-SPEZIFISCHER DATEN IM EEPROM

a) Lesen und Schreiben der eingestellten Systemdaten im EEPROM (Frequenz, etc.)
b) Lesen und Verarbeitung der Daten aus dem hardwaregeschützten Bereich des EEPROMs. Eine Änderung dieser wichtigen Systemdaten ist nur über die interne Systemschnittstelle des Empfängers, einem speziellen Stecker und der Konfigurationssoftware SePT.EXE möglich.

21.7 ÜBERWACHUNG DER BETRIEBSSPANNUNG UND SYSTEMRESETAUSLÖSUNG

a) Beim Power-UP auslösen eines Systemresets zum definierten Starten des Moduls
b) Bei kurzzeitigen Spannungseinbrüchen Auslösen eines Systemresets
c) Externe Resetmöglichkeit über Systemschnittstelle
d) Software Reset über die serielle Schnittstelle

21.8 ÜBERWACHUNG UND AUSWERTUNG DER SYSTEMFUNKTIONEN

a) Muting bei Unterschreiten des Squelchpegels
b) Schnellabschaltung bei RSSI-Pegeleinbruch > 40 dB
c) NF-Rauschsperre
d) Unterstützung des Remotebetriebs
e) Schalten der Booster-Feed Spannung
f) Standby Betrieb

21 PROCESSOR ASSEMBLY A014

21.1 DESCRIPTION

The processor assembly is built up on a four-layer circuit board of 76.2 x 25 mm. Signals and power supply are fed to the assembly via 49 contacts.

The processor assembly controls the receiver and the communication between receiver and external devices. It has the following functions:

21.2 CONTROLLING THE PLL

a) adjusting the operating parameters of the PLL
b) adjusting the frequency by adjusting the prescaler
c) reading the PLL_LD signal
d) calculating the frequency offset by IF

21.3 CONTROLLING THE LCD ASSEMBLY

a) displaying data on the LCD
b) reading the buttons UP, DOWN and SET via the LCD assembly

21.4 COMMUNICATION WITH EXTERNAL DEVICES

a) RS232 interface for PC configuration
b) Check and test interface
c) RS485 interface for PC and receivers (S-MCD)
d) Baud rate detection

21.5 MEASURING ANALOGUE SYSTEM PARAMETERS

a) measuring the RSSI voltages and their evaluation or display
b) measuring the deviation voltage of the demodulated signal and its evaluation or display
c) decoding and displaying the Low Batt signal

21.6 SAVING AND ADMINISTERING SYSTEM-SPECIFIC DATA IN THE EEPROM

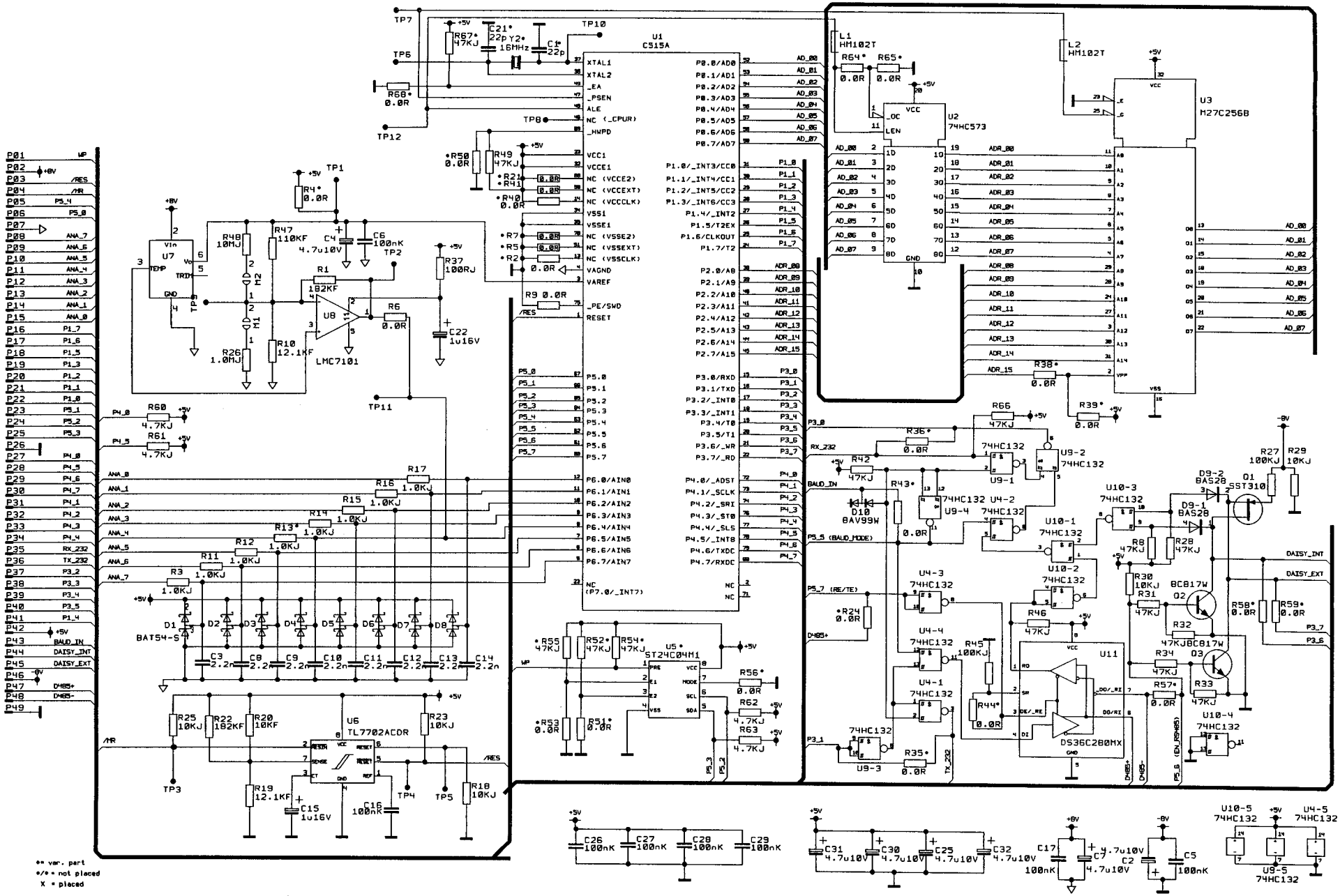
a) reading and writing the selected system data in the EEPROM (frequency, etc.)
b) reading and processing the data from the hardware-protected section of the EEPROM. The system data can only be changed via the internal system interface of the receiver by using a special programming connector and the SePT.EXE programming tool.

21.7 MONITORING THE OPERATING VOLTAGE AND ACTIVATING THE SYSTEM RESET

a) resetting the system during powering up to ensure a defined start of the assembly
b) resetting the system in case of short voltage drops
c) external reset via system interface
d) Software reset via serial interface

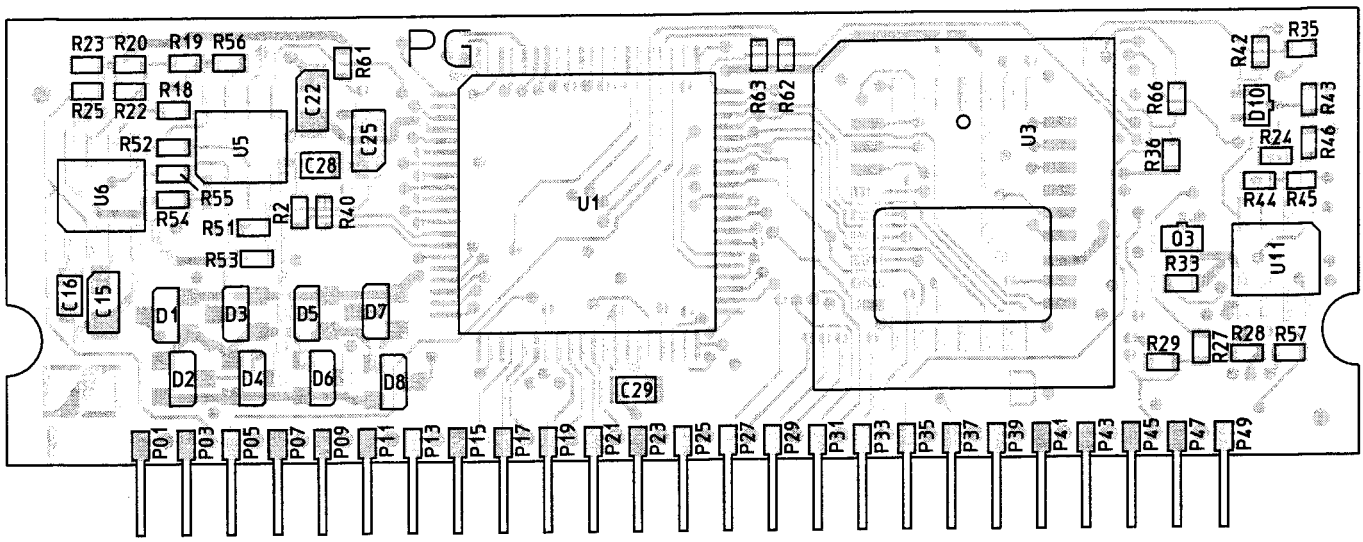
21.8 MONITORING AND EVALUATING THE SYSTEM FUNCTIONS

a) muting if squelch level drops below a preset value
b) fast switch-off if RSSI level > 40 dB
c) AF squelch
d) support for remote operation
e) control of the booster feed voltage
f) Standby operation

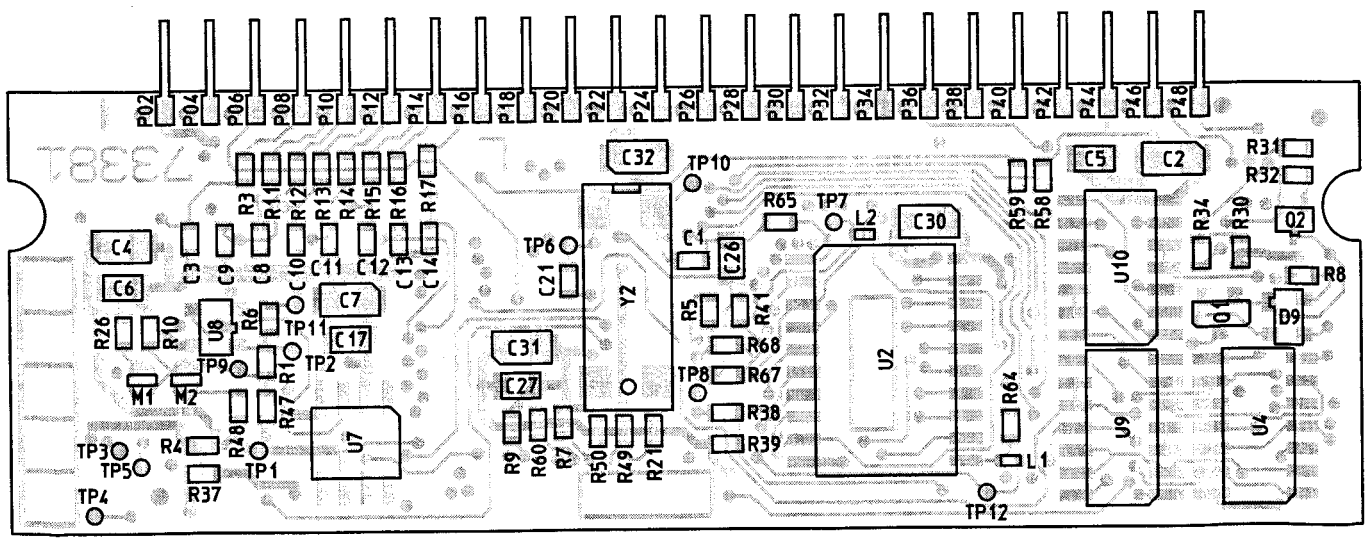


LP-best.	R2	R4	R5	R7	R13	R21	R24	R35	R36	R38	R39	R48	R41	R43	R49	R50	R51	R52	R53	R54	R55	R56	R57	R58	R59	R64	R65	R67	R68	C1	C21	U5	Y2
73771	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	X	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	X	*/*	*/*	X	22p	22p	*/*	16M

PROZESSOR-MODUL A014, STROMLAUFPLAN
PROCESSOR ASSEMBLY A014, CIRCUIT DIAGRAM



PROZESSOR-MODUL A014, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
PROCESSOR ASSEMBLY A014, PRINTED CIRCUIT BOARD, COMPONENT SIDE



PROZESSOR-MODUL A014, GEDRUCKTE SCHALTUNG, LÖTSEITE
PROCESSOR ASSEMBLY A014, PRINTED CIRCUIT BOARD, SOLDER SIDE

Pin No	Signal ext	Signal int	Direction	Type	Ri	Remark
1	NC	NC				
2	+8V	+8V	IN	Power		
3	/RES	/RES	OUT	digital		
4	/MR	/MR	IN	digital		
5	P5_4	LIGHT	OUT	digital		
6	P5_0	/DC_FEED	OUT	digital		
7	AGND	AGND	IN	Power		
8	P6_7	TUNE_STOP	IN	analog 0-5V		
9	P6_6	PLL_LD	IN	analog 0-5V	max.loading Imp.9kΩ	
10	P6_5	AF_SQ	IN	analog 0-5V		
11	NC	TEMP				internal
12	P6_3	BATT	IN	analog 0-5V		
13	P6_2	DEV	IN	analog 0-5V	max.loading Imp.9kΩ	
14	P6_1	RSSI_B	IN	analog 0-5V		
15	P6_0	RSSI_A	IN	analog 0-5V		
16	P1_7	DA_STR	OUT	digital		not used
17	P1_6	OPT_1	IN/OUT	digital		not used
18	P1_5	LCD_SCLK	OUT	digital		
19	P1_3	LCD_SDAT	OUT	digital		
20	P1_2	/LCD_CS	OUT	digital		
21	P1_1	/PLL_EN	OUT	digital		
22	P1_0	/LCD_BUSY	IN	digital		
23	P5_1	AF_MUTE	OUT	digital		
24	P5_2	EE_SCL	OUT	digital		not used
25	P5_3	EE_SDA	IN/OUT	digital		not used
26	DGND	DGND	IN	Power		
27	P4_0	SCLK	OUT	digital		
28	P4_5	SDAT	IN/OUT	digital		
29	P4_6	AF_ON_0	OUT	digital		
30	P4_7	DIV_AB	OUT	digital		
31	P4_1	OPT_3	IN/OUT	digital		not used
32	P4_2	OPT_4	IN/OUT	digital		not used
33	P4_3	OPT_5	IN/OUT	digital		not used
34	P4_4	OPT_6	IN/OUT	digital		not used
35	RX232	RX232	IN	RX232/5V		
36	TX232	TX232	OUT	TX232/5V		
37	P3_2	/TA_UP	IN	digital		
38	P3_3	OPT_2	IN/OUT	digital		not used
39	P3_4	/TA_DOWN	IN	digital		
40	P3_5	AF_ON_180	OUT	digital		
41	P4_1	/TA_SEL	IN	digital		
42	+5V	VCC	IN	Power		
43	BAUD_IN	BAUD_IN	IN	digital RS232/485 switch		
44	DAISY_INT	DAISY_INT	IN/OUT	digital RS485/CTRL		
45	DAISY_EXT	DAISY_EXT	IN/OUT	digital RS485/CTRL		
46	-8V	-8V	IN	Power		
47	D485+	D485+	IN/OUT	RS485+		
48	D485-	D485-	IN/OUT	RS485-		
49	GND	GND	IN	Power		

PROZESSOR-MODUL A014, PINBELEGUNG
PROCESSOR ASSEMBLY A014, PIN ASSIGNMENTS

Features

25 digital I/O ports
7 analog ports or 7 additional digital ports
1 x RS232 / 5V or RS485 Interface
16 MHz operating clock
32K x 8 EPROM (PLCC)
1280 Byte RAM
internal temperature measurement

mechanical data

dimensions	76,2mm x 25mm
assignment	49 solder contacts; 2x2,54 mm separation 2,5 mm
temperatur range	0°C ... 70°C

electrical data

7 analog / digital inputs	0V ... +5V; max. loading impedance: 9kOhm (analog)
1 reset input	dig. low -> RESET; dig high -> operation
1 reset output	dig. low -> RESET; dig high -> operation
reset threshold	< 4,3V-4,65V
digital I/O	
digital inputs	dig. low = 0V... 0,8V; dig. high = 1,8V ... 5V
digital outputs	dig. low: 0,45V, max 1,6mA; dig. high: 2,4V, max 80µA
operating voltage	4,75V - 5,5V
supply current	+5V / 24mA ±8V / ±1mA
Software	to be programmed for C515A (80C515A)

PROZESSOR-MODUL A014, TECHNISCHE DATEN
PROCESSOR ASSEMBLY A014, TECHNICAL DATA

22 PROZESSOR-MODUL A015

22.1 BESCHREIBUNG

Das Prozessor-Modul ist auf einer zweilagigen Platine mit den Maßen 76,2 x 25 mm und einseitiger Bestückung aufgebaut. Die Signale und die Spannungsversorgung werden dem Modul über 45 versetzte Kontakte zugeführt.

Das Prozessor-Modul übernimmt die Steuerung des Empfängers. Hierbei werden folgende Aufgaben wahrgenommen:

22.2 ANSTEUERUNG DER PLL

a) Einstellung der Betriebsparameter der PLL
b) Einstellung der Frequenz durch Einstellung der Teiler
c) Einlesen des PLL_LD Signals

22.3 ANSTEUERUNG DES LCD-MODULS

a) Ausgaben auf die LCD
b) Einlesen der Taster UP, DOWN und SET über das LCD-Modul

22.4 MESSUNG ANALOGER SYSTEMGRÖSSEN

a) Messung der RSSI-Spannungen und deren Auswertung bzw. Anzeige
b) Messung der Hub-Spannung des demodulierten Signals und deren Auswertung bzw. Anzeige
c) Dekodierung des LowBatt-Signals und dessen Anzeige
d) Messung und Auswertung der Squelch-Potentiometerspannung

22.5 SPEICHERUNG UND VERWALTUNG SYSTEMSPEZIFISCHER DATEN IM EEPROM

a) Lesen und Schreiben der eingestellten Systemdaten im EEPROM (Frequenz, etc.)
b) Lesen und Verarbeitung der Daten aus dem hardwaregeschützten Bereich des EEPROMs. Eine Änderung dieser wichtigen Systemdaten ist nur über die interne Systemschnittstelle des Empfängers, einem speziellen Stecker und der Konfigurationssoftware SePT.EXE möglich.

22.6 ÜBERWACHUNG DER BETRIEBSSPANNUNG UND SYSTEMRESETAUSLÖSUNG

a) Beim Power-UP auslösen eines Systemresets zum definierten Starten des Moduls
b) Bei kurzzeitigen Spannungseinbrüchen Auslösen eines Systemresets
c) Externe Resetmöglichkeit über Systemschnittstelle

22.7 ÜBERWACHUNG UND AUSWERTUNG DER SYSTEMFUNKTIONEN

a) Muting bei Unterschreiten des Squelchpegels
b) Schnellabschaltung bei RSSI-Pegeleinbruch > 40 dB

NOTIZEN:

22 PROCESSOR ASSEMBLY A015

22.1 DESCRIPTION

The processor assembly is built up on a double-sided circuit board of 76.2 x 25 mm. Signals and power supply are fed to the assembly via 45 contacts.

The processor assembly controls the receiver. It has the following functions:

22.2 CONTROLLING THE PLL

a) adjusting the operating parameters of the PLL
b) adjusting the frequency by adjusting the prescaler
c) reading the PLL_LD signal

22.3 CONTROLLING THE LCD ASSEMBLY

a) displaying data on the LCD
b) reading the buttons UP, DOWN and SET via the LCD assembly

22.4 MEASURING ANALOGUE SYSTEM PARAMETERS

a) measuring the RSSI voltages and their evaluation or display
b) measuring the deviation voltage of the demodulated signal and its evaluation or display
c) decoding and displaying the Low Batt signal
d) measuring and evaluating the squelch potentiometer voltage

22.5 SAVING AND ADMINISTERING SYSTEM-SPECIFIC DATA IN THE EEPROM

a) reading and writing the selected system data in the EEPROM (frequency, etc.)
b) reading and processing the data from the hardware-protected section of the EEPROM. The system data can only be changed via the internal system interface of the receiver by using a special programming connector and the SePT.EXE programming tool.

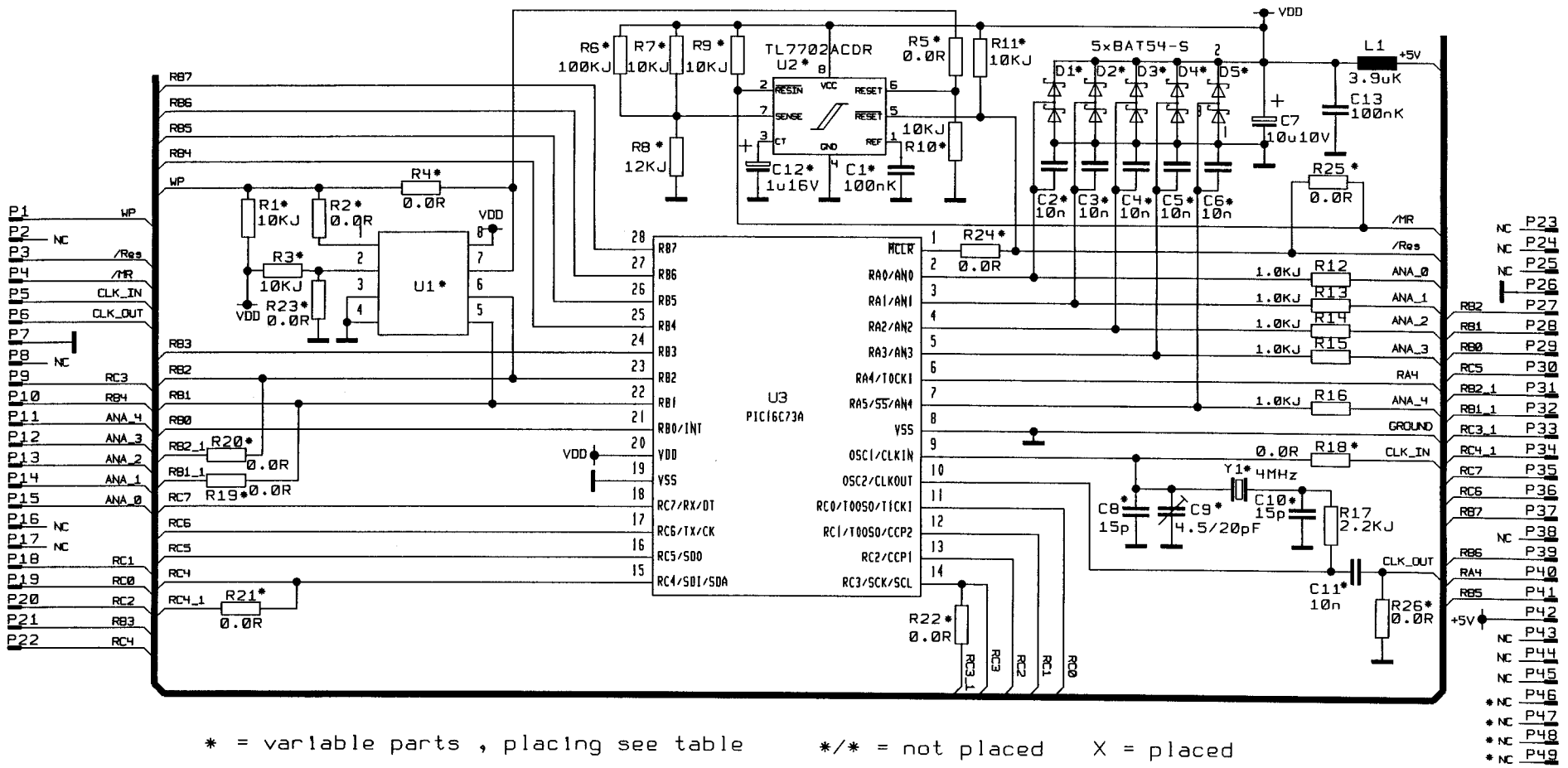
22.6 MONITORING THE OPERATING VOLTAGE AND ACTIVATING THE SYSTEM RESET

a) resetting the system during powering up to ensure a defined start of the assembly
b) resetting the system in case of short voltage drops
c) external reset via system interface

22.7 MONITORING AND EVALUATING THE SYSTEM FUNCTIONS

a) muting if squelch level drops below a preset value
b) fast switch-off if RSSI level > 40 dB

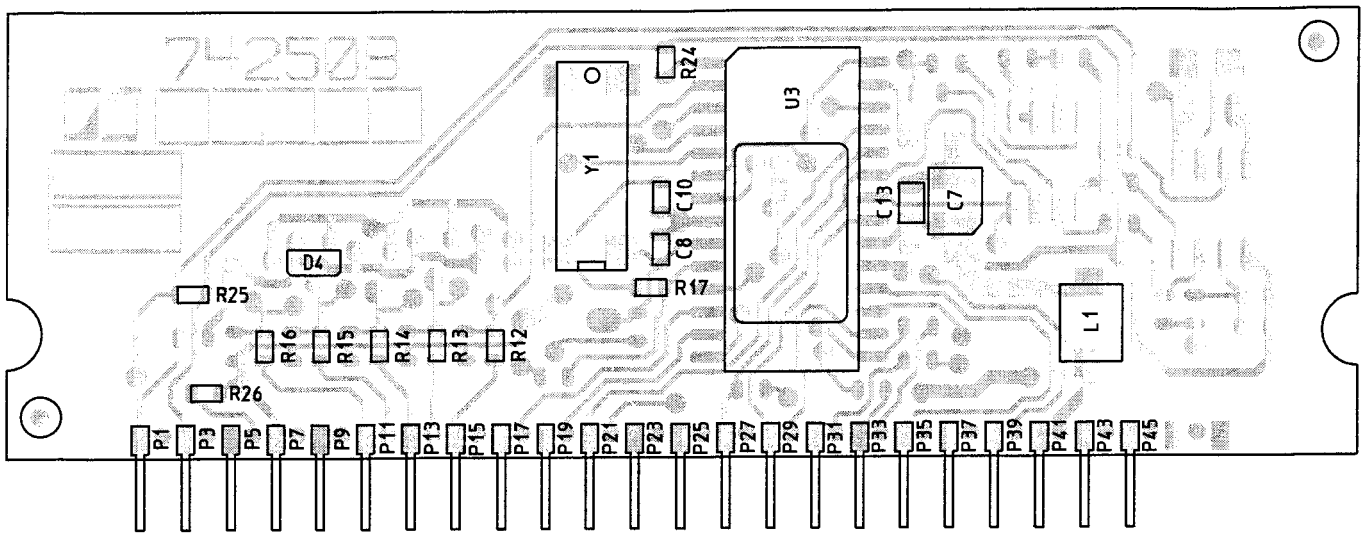
NOTES:



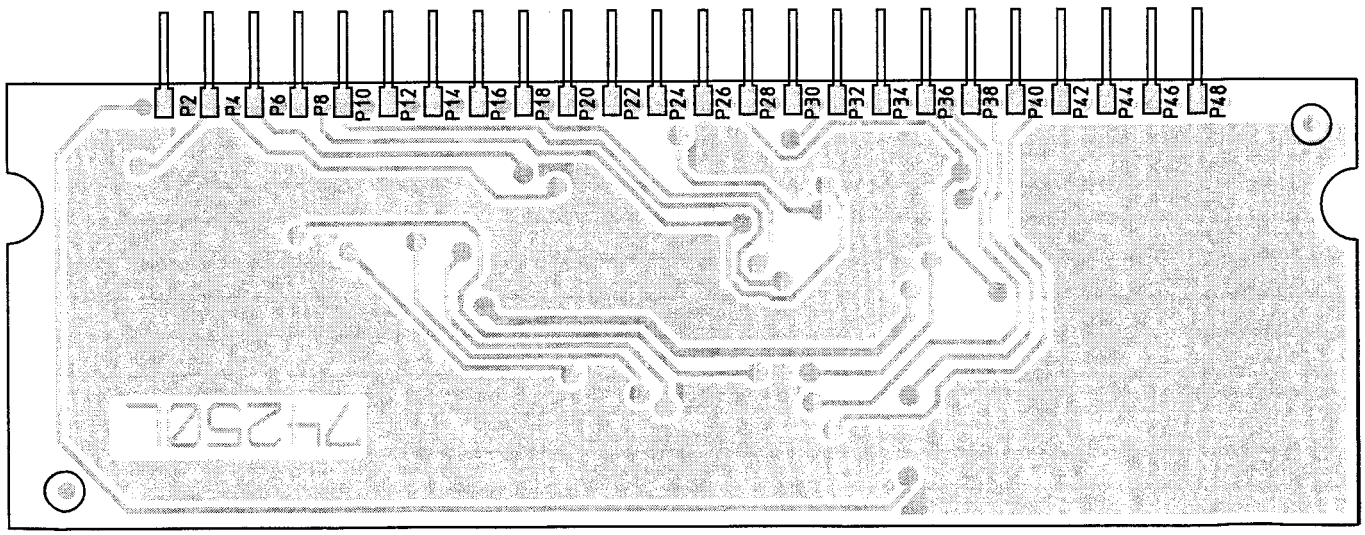
* = variable parts , placing see table */* = not placed X = placed

Baugr.	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R18	R19	R20	R21	R22	R23	R24	R25	R26	C1	C2	C3	C4	C5	C6	C8	C9	C10	C11	C12	P46	P47	P48	P49	D1	D2	D3	D4	D5		U1	U2	Y1
73717	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	X	X	X	*/*	*/*	*/*	*/*	*/*	*/*	X	*/*	X	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	*/*	X	*/*		*/*	X	4MHz

PROZESSOR-MODUL A015, STROMLAUFPLAN
PROCESSOR ASSEMBLY A015, CIRCUIT DIAGRAM



PROZESSOR-MODUL A015, GEDRUCKTE SCHALTUNG, BESTÜCKUNGSSEITE
PROCESSOR ASSEMBLY A015, PRINTED CIRCUIT BOARD, COMPONENT SIDE



PROZESSOR-MODUL A015, GEDRUCKTE SCHALTUNG, LÖTSEITE
PROCESSOR ASSEMBLY A015, PRINTED CIRCUIT BOARD, SOLDER SIDE

Pin No	Signal ext	Signal int	Direction	Type	Ri	
1	WP	NC	IN			
2	NC	NC				
3	/RES	/RES	IN	digital	] connection	
4	/MR	/MR		digital	] 0R	
5	NC	NC				
6	⊥ OUT	⊥	OUT		0R to ⊥	
7	⊥ IN	GND	IN	Power		
8	NC	NC				
9	RC3	PLL-LD	IN	digital		
10	RB4	AF-SQ	IN	digital		
11	ANA_4	SQ-IN	IN	analog 0-5V		
12	ANA_3	BATT	IN	analog 0-5V		
13	ANA_2	DEV	IN	analog 0-5V	max loading Imp. 9kΩ	
14	ANA_1	RSSI-B	IN	analog 0-5V		
15	ANA_0	RSSI-A	IN	analog 0-5V		
16	NC	NC				
17	NC	NC				
18	RC1	LCD-SCLK	OUT	digital		
19	RC0	LCD-SDAT	OUT	digital		
20	RC2	/LCD-CS	OUT	digital		
21	RB3	PLL-EN	OUT	digital		
22	RC4	/LCD-BUSY	IN	digital		
23	NC	NC				
24	NC	NC				
25	NC	NC				
26	⊥ IN	GND	IN	Power		
27	RB2	SCL	OUT	digital (IIC)		
28	RB1	SDA	IN/OUT	digital (IIC)		
29	RB0	AF-ON 0	OUT	digital		
30	RC5	DIV-AB	OUT	digital		
31	NC	NC				
32	NC	NC				
33	NC	NC				
34	NC	NC				
35	RC7	RXD	IN	digital (RS232)		
36	RC6	TXD	OUT	digital (RS232)		
37	RB7	/TA-UP	IN	digital		
38	NC	NC				
39	RB6	/TA-DOWN	IN	digital		
40	RA4	AF-ON 180	OUT	digital		
41	RB5	/TA-SET	IN	digital		
42	+5V	VCC	IN	Power		
43	NC	NC				
44	NC	NC				
45	NC	NC				

PROZESSOR-MODUL A015, PINBELEGUNG
PROCESSOR ASSEMBLY A015, PIN ASSIGNMENTS

mechanical data	
dimensions	76,2mm x 25mm
assignment	45 solder contacts; 2x2,54 mm separation 2,3 mm
temperatur range	0°C ... 70°C
electrical data	
0,3 or 5 analog inputs	0V ... +5V; max. loading impedance: <9kOhm
1 reset input	dig. low -> RESET; dig high -> operation
1 reset output	dig. low -> RESET; dig high -> operation
22, 19 or 17 digital I/O	(see analog inputs)
digital inputs	dig. low = 0V ... 0,8V; dig. high = 1,8V ... 5V
digital outputs	dig. low: 0,6V,max 25mA; dig. high: 4,3V, max 20mA
operating voltage	4,5V ... 6V
supply current	5mA (no load)
Software	to be programmed for PIC 16C73A

PROZESSOR-MODUL A015, TECHNISCHE DATEN
PROCESSOR ASSEMBLY A015, TECHNICAL DATA

22.12 ERSATZTEILE

22.12 SPARE PARTS

POS	IDENT	BEZEICHNUNG	DESCRIPTION
001	59730	Schild 10,0x6,4	Label 10.0x6.4
C007	45010	SMD Kondensator TA-KO 10uF 10V SUP8	SMD capacitor TA-KO 10uF 10V SUP8
C008	45176	SMD Kondensator KERKO 15pF 50V NPO	SMD capacitor KERKO 15pF 50V NPO
C010	45176	SMD Kondensator KERKO 15pF 50V NPO	SMD capacitor KERKO 15pF 50V NPO
C013	45855	SMD Kondensator KERKO 100nF 25V X7R	SMD capacitor KERKO 100nF 25V X7R
D004	45608	Diode Schottky BAT54S	Diode Schottky BAT54S
L001	45563	SMD Spule 3,9uH	SMD coil 3.9uH
P001	45782	Kontakt 0,4x0,25 (P001-P045)	Contact 0,4x0,25 (P001-P045)
R012	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R013	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R014	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R015	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R016	45132	SMD Widerstand 1k 5% 0603	SMD resistor 1k 5% 0603
R017	45134	SMD Widerstand 2k2 5% 0603	SMD resistor 2k2 5% 0603
R024	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R025	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
R026	45295	SMD Widerstand 0R 0603	SMD resistor 0R 0603
U003	59899	SMD IC MCU+AD 8Bit SO28 SUP24	SMD IC MCU+AD 8Bit SO28 SUP24
Y001	45794	SMD Quarz	SMD crystal